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# Toward an Analysis of Demographic and Economic Change in Tokugawa Japan: A Village Study

SUSAN B. HANLEY

JAPAN'S population, according to Bakufu statistics, grew at well under the rate of one quarter of one percent per annum during the last century and a half of the Tokugawa period.<sup>1</sup> Japanese historians have characterized the period as one of "stagnation," citing as reasons for the low growth rate the economic distress of both the samurai and peasant classes, which led them to practice abortion and infanticide, and frequent natural disasters followed by famines.<sup>2</sup> But while the consensus seems to be that depressed economic conditions, a population straining the limits of its resources, and direct population control caused the low growth rate, few scholars have attempted to go beyond these generalizations and examine the data that exist in order to determine actual population trends and the demographic behavior which caused such trends.<sup>3</sup>

Scholars have equally neglected an analysis of the relationship of population growth to changing economic conditions in Japan. In fact, economic evidence gathered within the past decade or two implicitly contradicts the view that the Tokugawa population failed to grow due to poor economic conditions. The new evidence seems to indicate that a majority of peasants, far from living at a bare subsistence level, were enjoying a rising productivity and a higher standard of living.<sup>4</sup>

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Susan Hanley is a Research Associate at the East-West Population Institute of the East-West Center. She wishes to thank Professors John W. Hall, Akira Hayami, Harry Miskimin, Hugh T. Patrick, and Kozo Yamamura for their valuable comments and criticisms during various stages of this study. Financial assistance by the Foreign Area Fellowship Program and the National Science Foundation is gratefully acknowledged.

<sup>1</sup>This growth rate was calculated on the basis of the aggregate population data collected by the Bakufu and cited in Sekiyama Naotarō, *Kinsei Nihon no jinkō kōzō* (The Population Structure in Tokugawa Japan) (Tokyo: Yoshikawa Kōbunkan, 1958), p. 139.

<sup>2</sup>Honjō Eijirō's "The Population of Japan in the 'Tokugawa' Era," *Tokugawa Bakufu no beika chōsetsu* (Price Adjustments by the Tokugawa Bakufu) (Tokyo: Kōbundō Shobō, 1924) probably provides the best summary in English of this view. See also Irene B. Taeuber, *The Population of Japan* (Princeton: Princeton University Press, 1958), Chapter 2 for a summary of the views of the major Japanese scholars on

this subject. The best known exponents of this view in Japanese are Takahashi Bosen and Honjō Eijirō. Takahashi has concentrated on the practices and effects of abortion and infanticide in Tokugawa Japan. See his *Datai mabiki no kenkyū* (A Study of Abortion and Infanticide) (Tokyo: Chūō Shakai Jigyō Kenkyūsho, 1936) and his *Nihon jinkōshi no kenkyū* (A Study of Japan's Population History), Vol. 1 (Tokyo: Sanyūsha, 1941), Vol. 2 (Tokyo: Nihon Gakujutsu Shinkōkai, 1955), and Vol. 3 (Tokyo: Nihon Gakujutsu Shinkōkai, 1962).

<sup>3</sup>The major Japanese scholar currently studying the Tokugawa population is Hayami Akira of Keiō University who has published his research results in a number of articles in Keiō's journal, *Mita Gakkai Zasshi* (Mita Journal of Economics).

<sup>4</sup>For evidence in English, see Thomas C. Smith, "The Land Tax in the Tokugawa Period," *Journal of Asian Studies*, XVIII, No. 1 (Nov. 1958), pp. 3-19. Writings revealing such evidence in Japanese are Shimpō Hiroshi, *Hōkenteiki shōnōmin no bunkai katei* (The Process of

Increasing urbanization, a growing commercial sector, and the gradual commercialization of agriculture are all indications of a growing economy and one which is producing a surplus. None of this new evidence fits into the explanation of a distressed population living to the limits of its resources.

The hypothesis, supported by the new economic evidence, that net village income was growing contradicts the standard interpretation of the population growth rate and necessitates a reexamination of the Tokugawa population, one which goes beyond observations of changing annual totals. Such an analysis can be made using the *shūmon-aratame-chō* or religious investigation registers. While not originally intended as a census, this investigation resulted in the collection of census data and vital statistics.<sup>5</sup> From these data, it is possible to determine whether the low growth rates were due to high death rates, low birth rates, high child mortality, possibly birth control, or a combination of these and other factors. Only from the *shūmon-aratame-chō* can statistics be compiled on average age at marriage, average number of children raised, average age at first and last childbirth (of children who lived past early infancy), average family size, the age composition of the population, the incidence of migration, and other kinds of demographic behavior which taken together provide

the Dissolution of Feudalistic Petty Farmers) (Tokyo: Shinseisha, 1967); Sasaki Jun'nosuke, *Bakuhhan kenryoku no kiso kōzō: "shōnō" jiritsu to gunyaku* (The Basic Structure of the Shogunate-Domain Power Structure: The Independence of the "Petty Farmers" and the Military Obligations [of the Samurai]) (Tokyo: Chūō Kōronsha, 1966); and Naitō Jirō, *Honbyakushō taisei no kenkyū* (A Study of the *Honbyakushō* System) (Tokyo: Ochanomizu Shobō, 1968). For additional references, see Susan B. Hanley and Kozo Yamamura, "A Quiet Transformation in Tokugawa Economic History," *Journal of Asian Studies*, XXX, No. 2 (Feb. 1971), pp. 373-384. Kozo Yamamura also provides both direct and indirect evidence in "The Increasing Poverty of the Samurai in Tokugawa Japan, 1600-1868," *The Journal of Economic History*, XXXI, No. 2 (June 1971), pp. 378-406.

<sup>5</sup> The *shūmon-aratame*, investigation of religion, was begun in the seventeenth century as a means of controlling Christianity and preventing its dissemination throughout the country. This investigation is known to have been conducted as early as 1624, but it was not carried out on a nationwide basis until after the Shimabara Rebellion of 1637-38. Extant records date from the 1670's. The form of the *shūmon-aratame-chō* or registers became almost identical to that of population surveys carried out on regional basis earlier in the century. This enabled the *shūmon-aratame-chō* to become the basis for national population surveys, the first of which was undertaken in 1721.

How the religious investigations were carried out varied by area, and the method obviously affected the reliability. In Okayama, a copy was sent each year to the domain government and a working copy was kept in the village. The working copy was kept up to date as a record of vital statistics by adding information regarding demographic

events occurring during the year. Thus deaths were noted by pasting a piece of paper (*harigami*) with the pertinent information to the entry of the individual who died, and persons who were born or married into a family were added to the end of the family entry. Every family entry of even the working copies has the seal of the householder verifying the contents, and thus the information can be considered to have been checked by the head each year.

Since it is the working copies left in the village which have been preserved in Fujito and in most villages, each register contains both a basic census of the village, on the first day of the year for Fujito, and a vital statistics record of demographic events which occurred during the calendar year following the census. For a description of the contents of these registers, see the following section in the text. For further discussions of the *shūmon-aratame-chō* and the reliability of the information contained in the registers, see Sekiyama, *Kinsei Nihon no jinkō kōzō*, Chapter 1, the most complete of the sources, and also Hayami Akira, "The Demographic Analysis of a Village in Tokugawa Japan: Kando-shinden of Owari Province, 1778-1871," *Keiō Economic Studies*, Vol. 5 (1968), pp. 50-88; Hayami Akira, "Tokugawa-kōki Owari ichi nōson no jinkō tōkei—Kaisai-gun Kando-shinden no shūmon-aratame-chō bunseki" (Population Statistics of One Farm Village in Owari in the Latter Half of the Tokugawa Period: An Analysis of the Religious Investigation Registers of Kando-shinden of Kaisai District), *Mita Gakkai Zasshi*, Vol. 59, No. 1 (1966), pp. 58-77; Honjō, "The Population of Japan in the 'Tokugawa' Era"; and Nomura Kanetarō, *On Cultural Conditions Affecting Population Trends in Japan* (Tokyo: The Science Council of Japan, Division of Economics and Commerce, 1953).

information on why the population was growing at such a slow rate. This evidence used in conjunction with economic data about a village or region can then provide clues as to whether the slow growth was due to a backward economy, disaster, and disease, or whether the population was growing at a slow pace, possibly through the actions of the inhabitants to check growth, while the economy was relatively prosperous and perhaps growing at a faster rate than the population.

The unit for which detailed population information can be obtained for Tokugawa Japan is the village, and thus it is at the village level that a demographic analysis of the period must begin. The limitations of small-scale case studies are obvious, but the data sources, and their availability and reliability, in addition to the problem of obtaining social and economic information for the area under study, necessitate the analysis of the Tokugawa population and its economic and social implications from the building blocks of just such case studies. It is from an accumulation of these studies that population patterns in Tokugawa Japan can be discerned and that comparative studies can be made between Japan's premodern population and that of European countries on which numerous parish register studies have been made.

The study presented here is of Fujito-mura, a village located in the northwest of Kojima, the southernmost district of the domain of Okayama.<sup>6</sup> In terms of population patterns and economic changes, Okayama might be considered a microcosm of Tokugawa Japan, with diverse demographic patterns and uneven economic development. The village of Fujito was located in the district showing among the largest population increases and the most rapid economic development, but though it shared in many of the economic developments, it had a population growth rate far below that of the district as a whole.

#### Population Records for the Village of Fujito

Fujito can be considered representative of a number of villages in the Kojima district in terms of its population and economic development, but it was selected for this study on the basis of the unusually good *shūmon-aratame-chō* and other records available, most of them collected and preserved by the Hikasa family, which dominated the administrative and much of the economic life of the village.<sup>7</sup> The *shūmon-aratame-chō* record a wide variety of information, ranging from demographic to social and economic. Listings are by household. Each household entry includes the temple to which each member belonged, the names of the family head and male and unmarried female family members, the position of each person in the household with relation to the head, any official village position held by a member, the number of servants or employees, and any cattle holdings. In addition, other information was noted where applicable, in particular, marriages, births, deaths, adoptions, and the destination of any individual who left the village for some reason during the year. The home village of persons coming to work in Fujito was noted in almost all cases, and the destination of Fujito inhabitants who left to work elsewhere was also reported.

*Shūmon-aratame-chō* are extant for Fujito for 42 years between 1775 and 1863.

<sup>6</sup> The domain of Okayama, part of the present prefecture of Okayama, was located on Honshū facing the Inland Sea.

<sup>7</sup> The records of the Hikasa family and of the

village of Fujito are now located in the Okayama University Library, Okayama, Japan. The case study presented in this article is based primarily on these documents.

Forty of these documents are complete, while two are partial. Major gaps exist between 1778 and 1794 and between 1810 and 1825, but otherwise the registers have been preserved for nearly every year through 1835 and for approximately every other year after that.<sup>8</sup>

While more of the annual registers have been preserved for other villages in Japan, the *shūmon-aratame-chō* for Fujito are in terms of the coverage of the entries among the most complete found to date, if not the most complete. The Fujito records are superior in that they contain more information with regard to demographic events than do most other registers; for example, children are recorded from year of birth.<sup>9</sup> It is obvious from the form of the registers that a consistent attempt was made to keep the Fujito records up-to-date, and it is presumed that there was little falsification of the records since the *shūmon-aratame-chō* were not used as a basis for allotting taxes or *corvée*. In addition, a variety of tests have shown the demographic data to be sufficiently reliable to use in making fairly detailed analyses of the population and demographic behavior of Fujito.<sup>10</sup> While biases and discrepancies do exist, the information is complete enough for most of these discrepancies to be discerned and in many cases corrected.

### A Demographic Analysis of Fujito

On the first day of 1775, 596 persons were registered as being in Fujito. On the first of 1863, there were 694 persons in the village, an increase of 16 percent in 88 years. The increase was not steady, however.<sup>11</sup> (See FIGURE I.) The population fell from 605 in 1797 to a low of 555 in 1806 and only then did it begin to increase again. It rose unevenly to a peak of 716 in 1859. The largest increases were in the early 1830's and the late 1850's, and the largest decreases took place between 1797 and 1806, between 1832 and 1833, and between 1837 and 1841.

The number of households increased at approximately the same rate as the population, growing from 100 in 1775 to 127 by 1861. The average number of persons

<sup>8</sup> *Shūmon-aratame-chō* are extant for Fujito for the following years: 1775, 1778 (partial), 1794, 1797-1806, 1808-1810, 1825-1835, 1837, 1841, 1844-1848, 1850, 1852, 1853 (partial), 1856, 1857, 1859, 1861, and 1863.

<sup>9</sup> Only 1.9 percent (12 out of 625) of the children who appeared in the Fujito registers and whose parents were married and living in the village in the year the children were born were not registered in the first year of life. In many domains it was common to register children only after they reached the second or third year of life, and in Wakayama, for example, children were not registered until age eight. Sekiyama, *Kinsei Nihon no jinkō kōzō*, p. 58.

<sup>10</sup> Tests performed to check the accuracy of the Fujito data include an examination of the sex ratios, the age structure, and the distribution of births and deaths by day of month. The data were also checked for the sudden inclusion of persons previously unlisted and the omission of inhabitants from the records without stated cause. Obvious errors were corrected before the data were analyzed.

The major weakness appeared to be that a number of marriages went unreported after 1840. After this date, a number of children were reported born to men who had no wives; at the same time the number of unmarried women rose. Since it is presumed that there were more marriages during this period than were reported, no attempt was made to calculate the proportions married.

<sup>11</sup> A linear regression equation in the form of  $Y = a + bX$  was calculated to show the trend in the population growth from 1775 to 1863. The constant  $a$  was 530.15 and the regression coefficient  $b$  was 1.66. This means that the trend line started from a base population of 530.15 persons and increased at a rate of 1.66 persons per year. The coefficient of determination  $R^2$  was .7339, which means that the fit of the trend line to the actual data was good, and statistically significant at the .01 percent level. The standard error of the constant was 3.63 and that of the regression coefficient .162. This trend line indicates that the population of Fujito was growing over time at a very slow rate.

FIGURE I—INDEX OF FUJITO'S POPULATION  
(BASE YEAR IS 1775)

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per household remained nearly constant at about 5.5 persons. The mean and mode of family size were close in value throughout most of the period.<sup>12</sup> In 1775, 43 percent of the families in Fujito had either five or six members (exclusive of household servants or employees), and while there was a greater spread of households in terms of family size in later years, the modal class was either five or six for most years until 1856, when the modal class changed to four and remained at this figure through 1863. In all years there were more families of four or fewer persons than of seven or more.

Large families were not common. There were usually no more than fifteen families in the village in any one year with more than eight members, though the inclusion of household servants or employees would make a few additional households exceed this size. On the other hand, there was a surprising number of one and two-person households. It is not known whether the individuals so listed were living along with a house to themselves, but on paper, at least, these persons were considered to constitute separate households. The peak in the number of one-person households came in the period 1800-1810, when there was an average of twelve such households per year. From 1845 on, the number of very small households declined, so that by the late 1850's there were only two one-person households. Thus in the late Tokugawa years when the average number of persons per household was falling, there was also a decrease in very small households, creating a more peaked (leptokurtic) distribution of households.<sup>13</sup>

<sup>12</sup> The term household is here used to denote all persons included in one listing in the *shūmon-aratame-chō*. The term family is used to denote all persons related to the head of the household. For all practical purposes, the family in Fujito is equal to the number of persons in the household minus any household servants or employees.

<sup>13</sup> The relatively constant mean in household size over the period was in large part due to the

small fluctuation in the number of family members around the mean in each household. In short, a family in which the modal and/or mean number was four tended to return to this number whenever the number of members either exceeded or fell below four. This was true for families of whatever size. This tendency was statistically tested by calculating the coefficient of variation for each household over time.

The most prevalent form of family composition in Fujito-mura was the nuclear family, with one married couple and their children. Families with more than one married couple were rare; until the late 1820's, there were more families which contained no married couples than there were families which had more than one married couple. More than three quarters of the persons registered in the village were immediate members of the nuclear family of the household head. A large proportion of the remaining quarter would also come under the category of nuclear family if the categorization were changed to include younger brothers and sisters of a young household head, instead of just the direct descendants and parents of the family head.

A population pyramid drawn for Fujito would have a very different shape from the usually pictured fan-shape of the typical underdeveloped country of today. Fujito's would have a relatively narrow base sloping only slowly inwardly toward a peak at the 85 and over age group. In fact, the sides would be almost perpendicular up to the 30 to 35 age group. The relatively narrow base and high peak were obviously caused by a relatively low birth rate and a relatively long life span for much of the population.

The age structure changed somewhat over time, with the major change occurring in the early part of the nineteenth century. Just over 60 percent of the population was in the working ages in each of ten years surveyed between 1775 and 1863.<sup>14</sup> Peak years were 1810 with 66 percent and 1837 with just over 65. The basic change was in

TABLE I—CRUDE BIRTH AND DEATH RATES FOR FUJITO  
(PER THOUSAND)

Year	Birth rate	Death rate	Year	Birth rate	Death rate
1775	11.7	18.4	1830	40.4	24.2
1794	26.7	15.0	1831	31.4	15.7
1797	23.1	38.0	1832	30.8	58.5
1798	20.5	18.8	1833	27.5	22.6
1799	10.3	10.2	1834	35.4	24.1
1800	22.4	24.1	1835	28.3	25.2
1801	13.9	12.2	1837	17.2	39.1
1802	14.0	19.3	1841	24.4	13.0
1803	17.9	16.1	1844	18.8	29.8
1804	8.9	12.5	1845	43.0	20.7
1805	17.9	16.1	1846	14.0	24.9
1806	23.4	14.4	1847	29.5	20.2
1808	21.2	17.6	1848	37.0	12.3
1809	24.3	22.5	1850	32.9	32.9
1810	24.7	12.4	1852	27.1	30.2
1825	32.4	17.1	1856	25.0	13.3
1826	22.0	25.4	1857	29.2	29.2
1827	22.0	22.0	1859	22.3	30.7
1828	28.3	23.3	1861	15.4	15.4
1829	21.4	14.8	1863	17.3	11.5

<sup>14</sup> The years examined were 1775, 1794, 1802, 1810, 1825, 1833, 1837, 1844, 1856, and 1863.

the 1 to 10 year-old group and the proportion of the population over 65 years of age. In 1775, 19 percent of the population was aged ten or under while 9 percent was 66 or older. By 1863, 23 percent was ten or younger and only 5 percent of the villagers were over 65. The change seems to have occurred between 1805 and 1825. In the former year, a low of 17 percent were ten or under and 9 percent were 66 and above. By contrast, in 1825, 25 percent or fully a quarter of the population were in the youngest group and persons over 65 had declined to 6 percent of the population.

Crude birth and death rates for the total population were calculated for each year for which there exist complete records. (See TABLE I.) Crude death rates, the proportion of deaths per thousand inhabitants, ranged from a low of 9.6 in 1799 to 55.7 in 1832. However, with the exception of 1832, there were no rates as high as 40 and only three years in which the death rate was over 30. There was no trend discernible in the crude death rates. Birth rates, which do not include infants who died without being registered, ranged from a low of 8.9 in 1804 to a peak of 40.4 in 1830. Again, no trend was discernible. Interestingly, during the late 1830's, the period of the Tempō famine, the death rate was not at a peak, nor did the birth rate reach its peak in the decade following the famine. The peak years for both births and deaths were 1830 to 1834. (See TABLE II.) Both birth and death rates were comparatively low for a premodern society.<sup>15</sup>

TABLE II—CRUDE BIRTH AND DEATH RATE AVERAGES FOR FUJITO  
(PER THOUSAND)

Years	Crude birth rates	Crude death rates
1794-1799 (4 years)	20.15	20.50
1800-1804 (5 years)	15.42	16.84
1805-1810 (5 years)	22.28	16.60
1825-1829 (5 years)	25.22	20.52
1830-1834 (5 years)	33.10	29.02
1835-1841 (3 years)	23.30	25.77
1844-1848 (5 years)	28.46	21.58
1850-1857 (4 years)	28.55	26.40
1859-1863 (3 years)	18.33	19.20

<sup>15</sup> The crude birth rates for Fujito follow the usual definition of the "ratio of total registered live births to the total population." George W. Barclay, *Techniques of Population Analysis* (N. Y.: John Wiley & Sons, Inc., 1958), p. 168. The key, of course, is "registered," and registration tends

to vary by country and period. In the case of Fujito, no child was registered who lived less than three weeks. Obviously, children who died at birth or in early infancy were not reported, but these births can be considered unimportant in a study of the social and economic significance of changes

### Childbearing Patterns

Childbearing patterns were obtained in two ways. First, marital and childbearing records were compiled for women who married after 1825 but who remained married until age 45 or whose marriages were terminated prior to 1863. Second, in order to analyze any changes in the number of children being born to and raised by women during the century under observation, women between the ages of 26 and 45 were divided into two birth cohort groups in eight sample years. (See TABLE III.) The 26 to 35 age group should show most accurately the age at which the mother bore her first child and the sex of the oldest children. The number of children born to and living with women in the 36 to 45 age group should most closely approximate the size of the completed family, as most of the childbearing would have been completed but most of the children being raised by the family would still be living at home.

The basic conclusion to be drawn from these two sets of data on family size is that women in Fujito raised on the average well under four children. Women who married after 1825 whose histories could be compiled had a completed family size of 3.5 children. The average number of children falls even lower if all women are included in the denominator. While the average for the century was always relatively small, differences do appear by decade, differences which would have a marked effect on the population growth rate in succeeding decades. In 1775 and 1794, over 80 percent of the women aged 26 to 35 were married and this age group averaged 1.9 and 2 children, respectively. However, by 1805, only 62 percent of the women in this age group were married and, consequently, while the average number of children born to married women rose, the average born to all fell to under 1.6. This was the year in which the total population of the village reached a minimum, and thus there were only 33 children living with 13 mothers aged 26 to 35, as compared to 96 children living with 39 mothers in the same age group in 1825, one of the years in the period showing the highest birth rates.

An analysis of frequencies of births by age of mother shows that almost all children born during 39 years of observation (years for which there are data between 1794 and 1863) were born to women between the ages of 21 and 40. In fact, prior to 1810, only three women under the age of 20 were recorded as having given birth in any of the years for which there are data, and only four women gave birth after age 41.<sup>16</sup>

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in the population. Although both the birth and death rates of Fujito are understated by the omission of children who died in early infancy, nevertheless the birth and death rates for Fujito can be considered low. For example, see the pre-modern crude birth and death rates for England and Wales cited in D. V. Glass, "Population and Population Movements in England and Wales, 1700-1850," in D. V. Glass and D. E. C. Eversley, ed., *Population in History* (London: Edward Arnold, Ltd., 1965), pp. 221-246; the rates for Scandinavia in Gustaf Utterstrom, "Two Essays on Population in Eighteenth-Century Scandinavia," *Population in History*, p. 538; and rates for Italy in Carlo M. Cipolla, "Four Centuries of Italian Demographic Development," *Population in History*, pp. 576-578.

<sup>16</sup> In every case but one in which a woman was reported as having a child at age 45 or above, there was a daughter or other female of childbearing age in the family. In nearly half of the cases in which a woman over 40 was reported as giving birth, there was another woman in the household. Because of the probability that at least in some of the cases the daughter or other member had in fact given birth, probably to an illegitimate child, the birth was attributed to the reported mother only if she was under the age of 45, unless there was no other female in the family. However, the number of births attributed to women over 45 was so few that none of the calculations made would be substantially affected by whatever categorization was made.

TABLE III—AVERAGE NUMBER AND SEX RATIO OF CHILDREN BORN TO WOMEN AGES 26 TO 45

Year	Women ages 26 to 35				Women ages 36 to 45				
	Average number of children		Sex ratio	Average number of children		Sex ratio	Average number of children		Sex ratio
	Born to mothers	(No. of mothers)	(No. of children)	Born to mothers	(No. of mothers)	(No. of children)	Born to mothers	(No. of mothers)	(No. of children)
1775	2.27	(22)	1.27 (50)	3.07	(28)	2.86 (30)	1.32 (86)		
1794*	2.32	(28)	1.41 (65)	1.85	(35)	1.85 (35)	1.41 (65)		
1805	2.53	(13)	1.06 (33)	3.26	(23)	2.88 (26)	1.14 (75)		
1825	2.46	(39)	1.23 (96)	2.73	(33)	2.20 (41)	1.14 (90)		
1835	2.16	(24)	1.36 (52)	2.95	(38)	2.73 (41)	.87 (112)		
1845	1.94	(37)	1.12 (72)	2.96	(26)	2.66 (29)	1.48 (77)		
1856	2.56	(30)	.93 (77)	1.29	(35)	1.10 (41)	1.37 (45)		
1863	1.81	(27)	1.13 (49)	3.20	(29)	2.45 (38)	.98 (93)		

\* In order to make comparisons possible from one decade to the next, the ages of mothers selected were adjusted so that, for example, in 1794 the women were ages 25 to 34 and 35 to 44. Similar adjustments were made for 1856 and 1863.

If the observations are categorized into three periods, births between 1794 and 1810, those between 1825 and 1837, and those occurring between 1841 and the end of the period, some pattern emerges. First, the modal class in all three periods was the age group 26 to 30. The second largest number of children was born to the 31 to 35 age group in the first two periods, but to the 21 to 25 age group in the third period. Also, there was an increase in the number of women giving birth before reaching age 20 in the years after 1825. Thus, the average age of mothers at the time of childbirth was falling slightly during the years under observation.

This kind of childbearing pattern bears out a high age at marriage and at first birth. The average age at marriage for women who married into or out of Fujito was always above 23 with the exception of 1775-78 when age at marriage averaged 21.8. From 1794 to 1863, averages for approximate five-year periods ranged from 23.4 to 25.7.<sup>17</sup> An estimate of average age at first birth is equally high. This estimate was made for various marriage cohort groups by extrapolating backward to the age of the mother at the birth of each child who was still living in the years for which the data exist. While consideration must be made for the fact that not all first births were included in the extant records (children who were born and died during gaps in the registers), there was a high age at first birth even for cohort groups for whom first-birth information is relatively reliable. The average age of estimated first birth for the 389 women whose complete or partial histories were compiled was 24.6. The average by marriage cohort group varied only slightly by period or completeness of data. For example, women who married between 1825 and 1841 and for whom records are fairly complete had a mean age of 23.8 at first birth. Women who married after 1841 but who reached age 45 or whose marriages were terminated prior to 1863 had an average age of 24.1 at first birth. Average age at marriage and first birth tended to coincide because of the Japanese custom of registering marriages often only after the bride become pregnant or bore her first child.

While average age at first birth tended to be high, the average age at last birth was low, and thus most Fujito women bore their children in a span of slightly over a decade. Estimated age at last childbirth was calculated in the same way that average age at first birth was. All averages ranged between 35.3 and 37.6 years of age. Women who bore five or more children completed their childbearing a few years later on the average, but from 1794 on the average age at which women completed their childbearing was always under 40.

While the average age at first birth can be explained by a relatively high age at marriage, it is more difficult to explain why women terminated childbearing at a relatively early age. This can be partially explained by the fact that for the marriage cohort group for whom the most information is available, women who were married between 1825 and 1841, 40 percent of the marriages were terminated before the women reached the age of 45 due to divorce or the death of one of the partners.

If the average childbearing period of a woman spans less than a decade and a half, then taking into account spontaneous abortions, miscarriages, and stillbirths, the

<sup>17</sup> To test for any change in the average age at marriage, the data were grouped by years to approximate five-year averages. The groupings were 1775-78, 1794-99, 1800-04, 1805-10, 1825-29, 1830-34, 1835-41, 1844-48, 1850-57, and 1859-

63. The sample sizes ranged from 20 to 42, size being related to the number of years for which there exist data in each period. From 1794 on there was no trend in average age at marriage, and the mean fluctuated around age 24.

number of live births could reasonably be expected to be 3.5, the average for Fujitomura.<sup>18</sup> This is particularly reasonable because the interval between births was approximately three years. These explanations still leave unanswered the questions of why fertility seems to have been so low and why the childbearing span was so short in Fujito.

### Migration

The factor of migration in Fujito population trends is difficult to analyze in terms of family migration because of gaps in the records, but the effect of individual or short-term migration can be readily studied. Fujito was by no means a closed society. The wide-ranging contacts of Fujito residents can be seen in marriage patterns. No more than one or two brides a year married men within Fujito. Since approximately as many women married into Fujito as married out, however, migration due to marriage did little to affect population trends in Fujito.

The period when migration had the greatest effect on population trends during the years for which data exist was the turn of the nineteenth century, the years when the population of Fujito steadily decreased. From 1794 to 1799, the birth rate equalled the death rate and from 1800 to 1804, the birth rate averaged less than one per thousand lower than the death rate. However, from 1797 to 1806, 46 more people migrated out of the village than migrated into it. Only 22 women married into the village, compared to 29 marrying out, but the women who married out accounted for only 27 percent of out-migration during the 1797 to 1806 period. Forty-seven persons, or 56 percent of the total, simply dropped out of the registers.<sup>19</sup> While a few of these may have been unrecorded deaths, 45 of the persons were males, most of them adults in their 20's and 30's. Eighteen of them were working outside the village in the year they were last recorded, which gives rise to the suspicion that most of the disappearances were due to men who left the village without permission to work elsewhere, in most cases permanently or at least for a number of years.

### Factors Affecting Population Growth

The growth rate of Fujito's population was influenced by a number of social and economic factors, in addition to being subject to the effect of natural disasters in the form of famine and epidemics. The specific factors to be analyzed here are famine, disease, the possibility that birth control was practiced, and social practices which affected demographic behavior. Finally, the relationship between the population trends and economic development both within Fujito and between Fujito and the surrounding area will be examined, including the effect produced on the standard of living in Fujito.

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<sup>18</sup> Peter R. Cox, *Demography* (Cambridge: Cambridge University Press, 1970), p. 152.

<sup>19</sup> In any year at least one or two persons were listed who did not subsequently appear in the registers. In cases in which the register for the following year was missing, there was no way to determine whether the person was later recorded as dying or leaving the village, but in any case, this number was very small for most years.

The number of such persons was significant only during the period under discussion. Since nearly all persons dropped from the records were adult males, it is likely that they left the village to work elsewhere without official permission and hence the village officials could list no official change in residence. A very few of these individuals reappeared again years later.

*The Effect of Famines*

The two worst famines in Tokugawa history occurred during the century under study, the Temmei famine of 1783–87 and the Tempō famine of the 1830's. The sixteen-year gap that exists between the 1778 *shūmon-aratame-chō* and that of 1794 makes it difficult to assess the effects of the Temmei famine on the population of Fujito. In an attempt to determine the effect of the famine on both childbearing and infant mortality, the percentage of women of childbearing age who bore children was estimated for the period 1775–1800, using records of women of childbearing age living in the village during these years and those of children born during this period. There was no discernible trend in the percentage of women bearing children over the 25-year period. Judged from the number of children alive in 1794, only 5.4 percent of the women of childbearing age gave birth to children who survived infancy in 1786, at the height of the famine, but at least 16 percent gave birth the following year, and over 21 percent in both 1788 and 1789. In fact, during this quarter of a century, there were only seven years in which over 21 percent of these women in childbearing years gave birth to children who survived, and three of them occurred between 1784 and 1789.

All of the 35 women in the 35 to 44 age group in 1794 had children living with them, though the average number of children per woman was lower, at 1.85, than for any of the other eight years examined except 1856. (See TABLE III.) Children were born during every year of the Temmei famine period who lived to 1794 and, in fact, 23 percent of the population was aged 1 to 10 in 1794. But the fact that all women aged 35 to 44 were married while the average number of children being raised was lower than in all other years but one gives rise to the suspicion that the population may have been trying to bring up its numbers.

There is no indication from the existing data that the Temmei famine had any devastating effect on the population of the village, nor is there any qualitative information on any famine in Kojima at this time. The age structure in 1794 was similar to that of 1775 with 8 percent of the population over age 65. The only indication that the village may have gone through some lean years is the small increase in the population from 1775 to 1794, and this may well have been due to causes other than crop failure, such as out-migration.

In contrast, the picture of the Tempō famine depicted in contemporary sources is dire. An official in the neighboring district of Tsuu observed: "The harvests were almost completely lost. Many poor died on the streets from starvation. The years 1833, 1835, and 1836 were extremely bad, but the peak came in the spring of 1837."<sup>20</sup> Many people in Kojima were reported to have died of starvation. The diet was so bad, consisting largely of dumplings made from the roots of bamboo grass (*sasa*), that many others suffered from acute diarrhea, which led to more deaths. However, it was also reported that "of those who died of diarrhea, seven out of ten were vagrants and not registered people."<sup>21</sup>

<sup>20</sup> The statement of the district head of Tsuu is quoted in Nagayama Usaburō, *Kurashiki shishi* (The History of Kurashiki City) (Kurashiki: Kurashiki Shishi Kankō Iinkai, 1963), Vol. 7, p. 377.

<sup>21</sup> The descriptions of the famine are from the

*Tempō nendo kikin jōkyō torishirabe-chō* (A report on the Investigations of Famine Conditions in the Tempō Years), compiled by the Okayama District Administration in 1888 and now located in the Kurashiki Municipal Library, Kurashiki, Okayama.

The suffering reported in the district of Kojima during the worst of the famine is not borne out by the population statistics for Fujito. While the death rate for the village was second highest for the 40 observed years in 1837, at 39.1 per thousand for the population, the peak of 58.5 came in 1832. The birth rate for 1837 was low at 17.2 per thousand, but it was lower for seven other years scattered throughout the forty for which there are data. In fact, the population grew by three persons between 1835 and 1837. Nor was the age structure substantially affected.

The toll from the famine seems to have come after the years of crop failure had ended. Between 1837 and 1841, the population fell from 639 to 614, rising again to 637 in 1844, and then falling to 628 in the next year. These decreases may have been due to disease which followed in the wake of the famine and which could have been especially destructive to an already weakened population.

The effects of the famine are more apparent in the individual family genealogies than in the aggregate village statistics. A random sampling of 12 families, about 10 percent of the total, reveals that only four of these families can be considered to have undergone no changes which might have resulted from the Tempō famine and its aftereffects. Two families were plagued by frequent deaths throughout the 1830's and both lines finally disappeared by the end of the 1840's. There was an unusual number of adoptions during the Tempō period, and particularly of the kind in which members other than a son or son-in-law were adopted into a family. Also, the number of families with "irregular" compositions increased, such as sisters adopting brothers who then married and brought in other women as brides. It was during the late Tempō period that the number increased of children who had only one parent registered in a household.<sup>22</sup>

The highest death rate for the Tempō period, and in fact the highest for all the years observed, occurred in 1832 when 39 persons died, 23 of them in the fourth month. Sixty-nine percent (27) of the deaths in that year were among children under age ten, but in all other years, with the exception of 1844, far more persons over age 36 died than did children. These deaths in 1832 must be attributed to disease. While there was nothing as devastating as the plague, a number of diseases were endemic in Japan, and 1832 was reportedly a very bad year, with cholera listed as the major killer.<sup>23</sup> The prevalence of child deaths may have meant that an epidemic of a disease which tended to strike the young, such as children's diarrhea (*ekiri*), measles, or smallpox, swept through the village.

In any event, Fujito had relatively high death rates throughout the Tempō period, but there is nothing to indicate suffering of the kind experienced in the Tōhoku region in northeastern Japan.<sup>24</sup> It is significant that vagrants were considered the group of people with the highest death rates. Most persons registered in Fujito did survive the period, but nearly all were living within the village during the famine

<sup>22</sup> This increase was partly due to the failure to report some marriages and partly due to an increase in widows and widowers. After the Tempō famine, an obvious attempt was made by the villagers to create "whole" families and to care for persons left without support or their immediate families. Thus widowed cousins and other peripheral relatives were taken in along with their children. Even old women were "adopted" in

the 1840's.

<sup>23</sup> Fujikawa Yū, *Nihon shitsubyōshi* (A History of Disease in Japan) (Tokyo: Heibonsha, 1969), p. 62.

<sup>24</sup> For example, Takahashi Bonsen focuses on the suffering of Tōhoku peasants in his *Datō mabiki no kenkyū*, providing both qualitative and quantitative evidence of the effects of the various famines in this region.

years. Families could feed only their own, but no one could depend on outside employment, a fact evident in the drop in 1837 and 1841 in the number of people who either left or came into Fujito for reasons of employment.<sup>25</sup>

### *Population Control Through Abortion and Infanticide*

Abortion and infanticide, while frequently referred to in Tokugawa literature and documents, have yet to be researched in terms of the impact of these practices on the growth rate of the population. An average number of births fluctuating around 3.5 for Fujito during the century under observation, combined with the existence of far higher completed family averages for other villages in Japan and other areas and time in human society, throws open the possibility that the inhabitants of Fujito were, in fact, consciously limiting the number of children they raised.<sup>26</sup>

The practices of abortion and infanticide were undoubtedly known to the Fujito villagers. A number of beliefs were prevalent in the district of Kojima with regard to the termination of pregnancies.<sup>27</sup> To try to induce abortion, women in the domain of Okayama used to cauterize the navel with moxa, brew the seed of the white morning glory and drink the brew, and eat black carp before the second month of pregnancy. There may have been midwives in the villages adept at performing primitive surgical abortions; no information is available.

To try to determine whether women were limiting the number of births they had, or the number of children who were registered and thus those permitted to live, the number of children born to each woman was examined against the duration of the period during which the women could be considered to have been

<sup>25</sup> The number of persons leaving the village for employment and coming into it for employment tended to follow a similar pattern, except that the number of persons leaving the village for employment was slightly larger than the number entering. For example, those leaving numbered in the thirties in 1775 and in the 1790's through the early nineteenth century, when the number began to drop. By 1810 there were only 17. In 1825, those leaving numbered only 11, and the figure continued to drop, reaching low points of four in 1837 and in 1847. Only in the 1860's did the number rise to as high as ten again.

<sup>26</sup> For example, in Kando-shinden of Owari Province, the average number of children born to women whose marriages lasted to age 45 was 7.5 if the women married between 16-20, 6.2 if they married between 21-25, and 4.8 if 26 or above. Hayami, "The Demographic Analysis of a Village in Tokugawa Japan," pp. 57-59, 73. On the other hand, in Kōmi village of Mino Province, the average number of children living with each couple in each year examined was slightly over 2 from 1674-1872. See Nomura Kenkyūkai, Kōmi Mura Kyōdō Kenkyū Han (The Nomura Research Group for the Study of Kōmi Village), "Ogaki hanryō Mino no kuni Motosu no kōri Kōmi mura no kokō tōkei," (Household and Population Statistics for the Village of Kōmi, Motosu District,

Mino Province, in the Ogaki Domain) *Mita Gakkai Zasshi*, Vol. 10, 11 (1960), pp. 200-201. And in Yokouchi village of Shinano Province, "from 1671-1725 married women who survived until age 45 with their husbands had 6.5 births if the women married between 15-20, 5.9 if married at 21-25, and 1.5 if at over 26. From 1726-75 they averaged 4.2 births if married between 15-20, 3.4 if at 21-25, and 3.0 if at over 26. And after 1776, women averaged 3.6-3.8 births whenever they married." The English summary appended to Hayami Akira, "Shūmon-aratame-chō o tsūjite mita Shinshū Yokouchi-mura no chōki jinkō tōkei—Kambun 11-Meiji 4" (Long-term Population Statistics of the Village of Yokouchi of Shinano Province Seen Through The Religious Investigation Registers, 1671-1871), *Sangyō Kenkyūsho Shirizu No. 202* (Management and Labor Study Series No. 202) (Tokyo: Keiō Gijuku Daigaku Sangyō Kenkyūsho, 1967-68). These data are obviously not directly comparable, but it can easily be seen that the Fujito averages are on the low side. Kando-shinden was a village located in a reclaimed area and thus may be considered to have been relatively underpopulated in the Tokugawa period, by comparison to earlier settled areas.

<sup>27</sup> Nishijima Minoru, *Edo jidai no sei seikatsu* (Sex Life in The Edo Period) (Tokyo: Yūzankaku, 1969), pp. 241-242.

exposed to the risk of pregnancy. While the average age at marriage tended to coincide with the average age at first birth, there was usually a number of years between the birth of a woman's last child and the end of the marriage or end of the childbearing years. For example, the mean age at which women, who were married between 1825 and 1841 and whose marriages lasted until they were 45, bore their last child was 36.7. For women married after 1841 this same statistic was 36.1 This means that the average woman had eight or nine years during which she could theoretically bear children but in which she, in fact, bore none.

Should the women of Fujito have prevented the rearing of unwanted children by means of infanticide, it is possible that a preference for one sex, most likely males, would show up in the sex ratios of the children. Two tests were made to see whether the sex ratios revealed any such preference and, hence, an indication of infanticide. First a test was made at eight points of time on the sex ratios of children born to and still living with women aged 26 to 35 to obtain the probability of each of the sex ratios occurring if the sex ratio of the universe is assumed to be one. Five of the sex ratios observed fell within one standard deviation of the universe mean; the remaining three were within two. The largest normal deviate obtained was for 1794, a value of 1.364, but even the sex ratio for this year could statistically occur more frequently than one out of five times. From the statistical point of view, there are no grounds for saying that the sex ratios were biased one way or another.

However, infanticide might not show up in the sex ratios of the first few children born. One could hypothesize that women would keep the first several children, whatever the sex, and exercise selection only when they had all or most of the children they desired. Therefore sex ratios were calculated for the last-born children of mothers in various marriage and/or birth cohort groups, groups for which the information regarding births varies in completeness due to gaps in the data. The sex ratio of last-born children of women married between 1825 and 1841 is 1.3, which given the sample size of 76, is 2.6 standard deviations away from the assumed universe mean of one. The sex ratio of the children last-born to women married between 1841 and 1863 but whose marriages or childbearing years terminated prior to 1863 is 1.7, which is over 5.4 standard deviations away from the universe mean. In fact, the only sex ratios of last-born children calculated which were within one standard deviation were those of children born to women whose marriages were contracted between 1794 and 1810 and to women aged 32 to 46 in 1825 who did not appear in the records prior to that year.

If women in Fujito were practicing infanticide during most periods, one explanation for the normal sex ratios for these cohorts is that their last-born children tended to be born in the 1820's, the period of the highest birth rate and the years during which the village economy began to rapidly develop. In other words, if population control were likely not to have been practiced at some period, it was most likely during this one.

On the basis of statistical tests made on last-born children, the null hypothesis that women were not committing infanticide can be rejected. This does not prove that they were, but severely biased sex ratios of last-born children and sex ratios of children born to women aged 26 to 35 above unity in seven out of eight years examined gives rise to the suspicion that perhaps all children born were not permitted to live. In addition, the small family size coupled with the early age at which women

ceased childbearing may indicate that women could also have been resorting to abortion or possibly some other means of birth control.

Numerous ways exist for a society to control the size of its population aside from direct birth control. Analysis of Fujito's population makes it obvious that many other methods were being used to limit the size of the population. First, the age of marriage for women was delayed to the point at which it worked as an effective means of population control. Few teenagers and relatively few women in their early twenties gave birth.

Second, the number of married couples per household tended to be limited to one. The domain government placed restrictions on the establishment of branch families, thus effectively aiding this custom.<sup>28</sup> If marriage within the family was restricted to only one son, the other sons had several choices open to them. In families with enough land to satisfy domain regulations, a branch household could be set up for younger sons, and this practice was prevalent among the wealthier families in the village. A grown son could be adopted into a family without male heirs, and this practice too was common in Fujito. A third option was to leave home to take up employment elsewhere, and a survey of persons who left the village to work makes it clear that most of these persons were younger sons. Finally, a younger brother could remain at home, and especially in the earlier years of the period under study, these men remained unmarried unless the wife of the older brother died.<sup>29</sup>

If families were limiting the number of children born to them, they increased the probability that no male child would survive to adulthood to continue the family line. The Japanese dealt with this problem through adoption. This well-known practice of samurai families was even more frequently resorted to by the commoner families of Fujito. Of 105 families for whom records exist for at least two or more generations, 56 families, or 53 percent, adopted sons or other relatives for the purpose of continuing the family line.

### *The Interrelationship Between Economic Development and Population Growth*

An analysis of the effect of famines and of demographic behavior on the pattern of population growth in Fujito leaves much to be explained. If the economic development of Fujito and the district of Kojima are examined in conjunction with changes in Fujito's population, the underlying factors in demographic behavior and the effect of economic and demographic changes on the village become clearer.

Fujito, during the Tokugawa period, was considered primarily an agricultural village. Rice was the staple crop grown, with the land being well suited to wet rice cultivation. By the late Tokugawa period commercial crops had come to form an important part of the village's output. Fujito was also well located for the develop-

<sup>28</sup> Taniguchi Sumio, *Okayama hanseishi no kenkyū* (A Study of the History of the Domain of Okayama) (Tokyo: Hanawa Shobō, 1964), p. 503 ff. The domain tried to regulate the establishment of branch families for fear that the unregulated establishment of new households would weaken the tax base.

<sup>29</sup> In a sample analysis made on 11 years be-

tween 1775 and 1863, the percentage of persons classified sister-in-law to those classified brothers ranged from a low of 27.3 percent in 1810 to a high of 54.8 percent in 1833. The years in which the percentage was highest were 1833 and 1841, while the years in which it was lowest were 1810, 1856, and 1863.

ment of commerce.<sup>30</sup> One of the three principal roads of the domain of Okayama passed through the village, the route going from the castle town to the port of Shimotsui. The road was heavily trafficked and there was a steady flow of people through the village.

Fujito can be considered representative of a number of villages in the Kojima district in terms of its development. In 1645, the rice yield of Fujito was officially assessed at 377 *kokū*, or approximately 1,930 American bushels, a yield which placed the village higher than average in a region in which assessed yields ranged from slightly under 100 to over 700 *kokū*. In 1789, the village still had the same officially assessed yield, but it had gained an additional 239 *kokū*, primarily from land reclamation and increases in productivity.<sup>31</sup> In the 1830's land reclamation projects were begun once again, this time on a larger scale. Three projects, completed in 1837, 1854, and 1865, may have added as much as 20 percent to the arable land in the village.<sup>32</sup>

Landownership in the last half of the Tokugawa period was dominated by two large families, the Hoshijima and the Hikasa. The Hoshijima holdings reached a peak in 1841 when their total output was assessed at 75 *kokū*. The Hikasa accumulated most of their land in the early nineteenth century, holding land assessed at 60 to 70 *kokū* through the years 1818 to 1827. The holdings of both families had fallen by more than a third by the mid-1840's.<sup>33</sup>

The pattern of holdings also changed over time for smaller owners. The total number of holders increased from 124 in 1742 to 128 in 1806 and to 142 in 1828, fell to 135 in 1841, and increased again to 149 by 1865.<sup>34</sup> Although the number of holders increased, so did the average size holding. Throughout the period 1604 to 1828, the two largest classes were those holding less than one *kokū* and between one to three *kokū*. Gradually the number of persons holding 3 to 5 *kokū* increased, so that by 1857 the two largest groups were those holding 1 to 3 and 3 to 5 *kokū*. This probably was made possible by the decrease in the acreage held within the village by the two largest families. The decline in the landownership in Fujito of these two families paralleled the increase in commercial activities of at least

<sup>30</sup> Fujito Chōshi Henshū Inkaï, ed. (Editorial Board of "A History of the Town of Fujito"), *Fujito chōshi* (A History of the Town of Fujito) (Okayama: Fujito Chōshi Henshū Inkaï, 1955), p. 163.

<sup>31</sup> These figures were obtained from the *Kojima gunson mura meisai-chō* (Detailed Village Records on Villages in The District of Kojima), collected and copied by Nagayama Usaburō and now located in the Kurashiki Municipal Library. Tax assessments, as well as holdings of individual farmers, were all calculated on the basis of output in rice equivalent in the *kokū* unit (1 *kokū* equals 5.12 American bushels) rather than on land area. Since the productivity of land varied widely, output rather than area better approximates wealth.

<sup>32</sup> *Fujito chōshi*, pp. 120-121. The percentage is an estimate made by the author of this article on the basis of a map on p. 120. No data were provided.

<sup>33</sup> These figures, compiled from the *O'ngumai*

*toritate sanyō-chō* (Records of Rice Tax Computations) of Fujito are shown graphically in Ota Ken'ichi and Matsuo Keiko, "Bakumatsu-Meiji shoki ni okeru jinushisei no tenkai—Okayama-han Kojima no kōri Hikasa-ke o chūshin to shite" (The Development of the Landlord System in the Bakumatsu and Early Meiji Periods: With a Focus on the Hikasa House of the Kojima District in the Domain of Okayama), *Okayama Shigaku* (Okayama History), No. 7-6 (June 1960), p. 63. The authors of the *Okayama-ken no rekishi* (The History of Okayama Prefecture) (Okayama: Okayama-ken, 1962) stated: "That such large landholders as the Hikasa could increase their economic power was due to the fact that the land tax [*nengu*] did not rise *pari passu* with agricultural productivity. This meant that the land tax was low and the tenants worked efficiently on their tenant farms," p. 374.

<sup>34</sup> Ota and Matsuo, p. 52.

the Hikasa family and occurred at a time when this family was also making heavy land investments in Kōjō-shinden, one of the major reclamation projects in Kojima. The trend reflected greater profits in commercial activities and *shinden* (new field) ownership than in the traditional form of heavily taxed landownership.

The Hikasa family was extremely instrumental in the development of commerce in Fujito. Their endeavors included the shipping of goods, dealing in fertilizers, and the dyeing of cotton cloth, all major industries within the Kojima region, particularly from the mid-Tokugawa period on. The peasants of Fujito, in addition to engaging in small commercial activities, became active in the cotton industry. Certainly by the 1830's it was one of the major sources of income for the village. In 1837, 20 percent of the cultivated land in Fujito was planted in cotton.<sup>35</sup> In addition to growing cotton, the villagers went into the weaving of Kogura-ori, a weave for which this region became famous.<sup>36</sup> In 1842 Fujito had an average of one loom per house, and there were a few households containing as many as three looms.<sup>37</sup> By this period, weaving had become more than a by-employment for many families, because Kogura-ori, which went largely untaxed, was more profitable than farming.

The scale of the cotton business can be assessed by two permits granted Fujito residents. In 1814, three persons, two from the neighboring village of Amaki and one Gobei from Fujito, were given permission to organize a cotton *ton'ya*, a wholesale house. This group dealt in cotton goods not only in these two villages plus the neighboring areas, but also competed with the *ton'ya* in the castle town in sending cotton through the port of Shimotsui to places outside the domain.<sup>38</sup>

By 1841, most of the persons holding less than 5 *roku* in land were also working outside agriculture, either in commercial activities in the village, as peddlars going from village to village, or as wage laborers in various small industries in farming villages.<sup>39</sup> Much of the evidence of the prevalence of by-employments in Kojima, particularly weaving, comes from a variety of regulations. Villagers were so actively engaging in weaving that, in 1823, village headmen in the district tried to have it banned.<sup>40</sup> The specific complaint was that it had become difficult to obtain agricultural workers, wages were rising, and thus agricultural operations were impeded. The Okayama administration refused to hear the headmen's plea on the

<sup>35</sup> Ota and Matsuo, p. 76.

<sup>36</sup> Information on the development of the production of Kogura-ori was obtained largely from Ono Masao, "Okayama-han ni okeru Ogura orimono no ryūtsū keitai—Kaei-Ansei-ki o chūshin to shite" (Patterns of Trade in Kogura Weave in the Domain of Okayama: With a Focus on the Period 1848–1854), in Hōgetsu Keigo Sensei Kanreki Kinenkai, ed. (Committee for the Commemoration of the Sixty-first Birthday of Professor Hōgetsu Keigo), *Nihon shakai keizaiishi kenkyū, Kinsei hen* (A Study of the Social and Economic History of Japan, Volume on the Tokugawa Period) (Tokyo: Yoshikawa Kōbunkan, 1967), pp. 440–465, and from Taniguchi Sumio, *Okayama han-seishi no kenkyū*, pp. 631–634.

<sup>37</sup> Ono, p. 460.

<sup>38</sup> Okayama Shiyakusho, *Okayama shishi, Sangyō keizai hen* (The History of Okayama City, Vol-

ume on Industry and the Economy) (Okayama: Okayama Shiyakusho, 1966), p. 286. Around 1850, Hikasa Yūtarō was also authorized to sell Kogura-ori to *engoku*, "distant places." Ono, p. 454.

<sup>39</sup> Taniguchi Sumio, "Kinsei ni okeru Bizen Minami Kojima no shōhin seisan to ryūtsū" (Commodity Production and Distribution in Southern Kojima of Bizen in the Tokugawa Period), in Fukuo Takeichirō, ed., *Naikai sangyō to suin no shūteki kenkyū* (Historical studies of Industry and Water Transport in the Inland Sea) (Tokyo: Yoshikawa Kōbunkan, 1966), p. 265. That such by-employments were common in Tokugawa Japan can be seen in Thomas C. Smith, "Farm Family By-employments in Preindustrial Japan," *The Journal of Economic History*, Vol. XXIX, No. 4 (Dec. 1969), pp. 687–715.

<sup>40</sup> This incident is cited in Ono, p. 460.

grounds that by-employments were necessary in Kojima because the average amount of land held was so small. By the Tempō period, the number of looms per household was officially limited to one in order to permit a family to earn some extra income but not to indulge in large-scale industry which might be detrimental to farming in the region. By this regulation officials hoped to control a situation that was felt to be getting out of hand.

Changes in economic conditions are mirrored in records of employment in the *shūmon-aratame-chō*. Prior to 1810, it was common for workers to come into Fujito to work, usually on a yearly contract. In 1775, 51 such persons were listed in the *shūmon-aratame-chō*. It was equally common for Fujito residents to go out to work elsewhere, many of them to the castle town of Okayama. After 1825, the number of persons both coming to and leaving Fujito on employment contracts was sharply reduced, and from that year on not a single person went to work in the castle town.<sup>41</sup> The drop in migration for employment reasons undoubtedly reflects the development of an increasingly viable commerce in the Kojima district and within Fujito itself, with an accompanying increase in the demand for labor. Landowners found it difficult to attract labor as wages in the commercial and manufacturing sectors were higher.<sup>42</sup> In fact, the Hikasa found it necessary to bring families in from Shikoku and other regions to farm the newly reclaimed fields it held.<sup>43</sup>

If the developments in Fujito are put in the perspective of the development of Kojima as a whole, changes in employment migration patterns are easily explained. In the first half of the Tokugawa period, commercial activities centered on the castle town, and thus it was Okayama that attracted rural labor. With the development of the Western Shipping Route (Nishimawari-kaisen), the port of Shimotsui became increasingly important, and its development was further accelerated by the stranglehold, in the form of monopolies, which the merchants put on the castle town through their guilds. Agricultural productivity was rising, and with the development of commerce, villagers with little or no land of their own found it more attractive to either leave the village to seek employment in the faster developing areas within Kojima or to get into commercial activities within the village.<sup>44</sup> Fujito was not at the forefront of these commercial activities, and this might well explain why so many persons left the village around the turn of the nineteenth century.

By the 1820's and 1830's, the commercial developments were taking place in Fujito itself, and in addition, the village had once again begun land reclamation projects. The economic developments were reflected in the demographic behavior of the villagers. People no longer left the village to find employment; instead the economy could adequately support additional people, and a higher proportion of younger brothers and second and third sons were permitted to marry. The birth rate was higher during the late 1820's and the first half of the 1830's than it was for any other period for which there are records. The Tempō famine and the epidemic of 1832 put an obvious check to the population growth rates which should have resulted

<sup>41</sup> This undoubtedly reflects the declining role of the castle town as a commercial center.

<sup>42</sup> The cotton industry in particular attracted labor as wages in this industry were high. Taniguchi, *Okayama hanseishi no kenkyū*, p. 632.

<sup>43</sup> Ota and Matsuo, p. 85. These people came as

tenant farmers, but many were later able to acquire land of their own.

<sup>44</sup> Taniguchi discusses this in "Kinsei ni okeru Bizen Minami Kojima no shōhin seisan to ryūtsū," p. 264 ff.

from the demographic events of the previous decade. But within a decade the population was once again growing steadily.

What effect did the economic developments of the nineteenth century, combined with the rate of population growth, have on the life of Fujito villagers? First, the form of livelihood changed for many. No longer did the landless have to work as farm laborers for the large landholders; they could work for higher wages in commerce or in handicrafts. Those with small amounts of land were, by at least the Tempō period, able to supplement their incomes with money earned from weaving in off-seasons. And families that depended on farming alone for a living now held on the average more land than they had three-quarters of a century before.

On the other hand, while the population of the village rose, few changes took place in family composition. The nuclear family remained the basis of the household and many families had even fewer members than in the late eighteenth century, evidenced by an increase in four member households. There were more children in the village and a corresponding decrease in the elderly, which meant that the population was, on the average, growing younger. This increase in the proportion of those ages 1 to 10 obviously made possible increases in the population during the Meiji period by which time these children were producing families of their own. Since the elderly, a consuming group, were replaced by children, another consuming group, the proportion of the population in the working ages remained nearly stationary. This proportion, always well over 60 percent, is high for any society, and is conducive to economic growth.<sup>45</sup>

The increase in commercial and manufacturing activities, evidence of labor shortages, and increases in agricultural productivity and the cultivated acreage, coupled with stable family size, are indications of a rise in the per capita income and in the standard of living within Fujito. Further evidence of a rise in the standard of living comes from descriptions of changes in the peasants' way of life. A list of the increasing number of articles villagers in Okayama were able to buy provides partial evidence of such changes. As early as 1655, the domain government tried to put a stop to peddling in the rural areas, but being unable to effectively do so, it decided to license these activities instead.<sup>46</sup> In 1666, the eleven items permitted for sale by peddlars hawking their wares in the farming villages consisted of fishing nets, dried fish, salt, dried seaweed, tea, rapeseed oil, kindling wood, agricultural tools, and several other necessities. By the early eighteenth century, the list of items also included pottery, cotton, pans, rice pots, straw mats, paper, fans, and rulers.<sup>47</sup> By the nineteenth century, villagers were buying hair oil, perfume, cosmetics, and incense from these peddlars.<sup>48</sup>

<sup>45</sup> See Joseph J. Spengler, "Demographic Factors and Early Modern Economic Development," *Daedalus* (Spring 1968), pp. 441-444. The percentage of the population aged 15-64 in northern European countries in the eighteenth and nineteenth centuries tended to be around 60, a percentage which "was favorable to average productivity," p. 441. In contrast, the countries of Africa, Asia, and Latin America today have percentages well below 60.

<sup>46</sup> Andō Seiichi, *Kinsei zaikata shōgyō no kenkyū* (A Study of Commerce in the Rural Areas in the

Tokugawa Period) (Tokyo: Yoshikawa Kōbunkan, 1958), p. 125. The domain government felt the peasants were overspending on items they did not need, evidence in itself that the peddlars must have been selling items other than sheer necessities.

<sup>47</sup> Fujisawa Yasushi, "Shōhin ryūtsū kara mita jōkamachi Okayama to zai" (The Castle Town of Okayama and the Countryside Seen from Commodity Distribution), *Okayama-ken no Rekishi* (History of Okayama Prefecture) (journal, n.d.), p. 173.

<sup>48</sup> Andō, p. 129.

If the standard of living had been rising as all evidence seems to suggest, why did Fujito villagers raise so few children? The small family size together with sex ratios of children favoring males suggest that the villagers may well have been limiting the number of children they brought up. Evidence from the Tōhoku region, which was the area hardest hit by famines throughout the Tokugawa period, indicate that infanticide and abortion were carried out largely because of economic duress. There is no indication for either Fujito or the Kojima region that such pressures existed.

It the average family size was being lowered because the economically pressed were limiting family size, one would expect to find that family size differed by income class. However, if families in Fujito are subdivided by landholding class, the only noticeable difference among the subgroups is in the sex ratio of children.<sup>49</sup> The sex ratio of children born to women who married from 1825 to 1841 into households holding between 3 and 6 *koku* of rice lands was 2.23, a ratio completely out of line with the normal sex ratio and one far above any other ratio existing for any other group in any other period.<sup>50</sup> For this period, the groups with the lowest sex ratios were those holding no land or less than one *koku* in land. On the basis of these data, one might argue that landholdings had little relationship to population control through infanticide, that families with land sufficient to live on were more concerned with having an heir than the landless, or that by the late Tokugawa period landholding had relatively little relationship to household income. On the other hand, it is equally possible to argue that any distortions in the sex ratio are the result of statistical happenstance, particularly since the average number of children was the same for all subgroups.

Given the economic evidence available for Fujito and the Kojima district, it is extremely unlikely that villagers were committing abortion and infanticide because they could not feed any more mouths. In fact, since the population of Kojima as a whole increased by at least 70 percent from 1679 to 1834,<sup>51</sup> all evidence points to the ability of the district to support an increasing population. Based on evidence of commercial activities and an increase in the items purchased, this population enjoyed a considerably higher standard of living by the end of the Tokugawa period than it had even a hundred years previously.<sup>52</sup>

### Conclusion

A study of the population trends and economic development in one village can be considered only a first step in the study of demographic and economic change in Japan during the Tokugawa period. But the village of Fujito does provide one

<sup>49</sup> Age at marriage and first birth, average number of children in the completed family, the interval between the end of childbearing and the termination of the marriage or age 45, the sex ratio of children born, and the incidence of adoption were all analyzed by the landholding class of women married between 1825 and 1841 and women married after 1841 but whose marriages and/or childbearing years were terminated prior to 1863.

<sup>50</sup> The sample comprised 100 women. Even a household holding 3 to 6 *tan* (¾ to 1½ acres) in

land could by no means be considered a large landowner. Undoubtedly these households too engaged in by-employments in order to make what was considered an adequate income.

<sup>51</sup> For a list of available population figures on Kojima and the other districts in Bizen Province of Okayama, see Susan B. Hanley, "Population Trends and Economic Development in Tokugawa Japan: The Case of Bizen Province in Okayama," *Daedalus* (Spring 1968), p. 627.

<sup>52</sup> A disclaimer should be made here as to what is meant by rise in standard of living. It is not

example of a pattern of demographic behavior which existed in Japan during the eighteenth and nineteenth centuries.

Despite the slow rate of population increase, the word "stagnating" seems inappropriate to describe the developments taking place in Fujito, and certainly inapplicable from the Tempō period on. While the population showed few increases, and even decreases in many years during the first part of the period examined, most of the decreases can be explained by economic developments which took place in neighboring areas and which drew off labor from Fujito.

Due to a number of factors, however, the population of Fujito at no time grew rapidly. Famine and disease obviously contributed to the slow growth rate, yet famine and disease did not debilitate the population. And most deaths occurred among the very young and the over 50 age groups. A major factor limiting Fujito's population was in the form of social control, behavior by the society as a whole which acted to limit population growth. The most obvious forms were limiting the number of nuclear families per household to one in most cases, postponing the age at marriage for females to the mid-twenties, and sending younger sons out to work or to be adopted in another village or household. It is also possible that Fujito residents were practicing some form of birth control, probably abortion and infanticide. The small family size, the slight excess of male over female children, and the distorted sex ratios of last-born children suggest that families consciously sought to limit the number of children they raised.

For whatever reasons population growth was slow, it is clear that by the mid-nineteenth century the economy was growing somewhat faster than the population. The spread of commercial and handicraft industries throughout the village meant that landless persons could more easily earn a living, and farmers were for a variety of reasons farming on the average a larger acreage. Persons who could not earn a living in the village could leave for the commercial centers of the district. Because population growth lagged behind economic growth, per capita income must have been rising, creating a higher standard of living for many and a surplus in the hands of some individuals. While Fujito-mura was only one of thousands of Tokugawa villages, many of the developments occurring there were representative of what was occurring throughout many regions in Japan.

Few similarities can be found between Tokugawa Japan and India or other underdeveloped countries of today in terms of demographic behavior and population patterns. Instead, the demographic trends and economic developments of Tokugawa Japan can best be likened to what seems to have occurred in England in the century prior to the Industrial Revolution. While bad crop years are known to have occurred in England, it seems that social customs were far more important in preventing a rapid increase in population during much of this century.<sup>53</sup> As in Japan, the economy developed at a rate not rapid in terms of twentieth century growth, but one

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argued that Japanese peasants were living well by today's standards—in fact, it is not hard to find evidence on the poor living conditions in many villages—but that in relative terms the people in Fujito were better off in the mid-nineteenth century than they were a century or two earlier.

<sup>53</sup> Examples of such customs are a high aver-

age age at marriage for women and low proportions married. See J. Hajnal, "European Marriage Patterns in Perspective," *Population in History*, pp. 101-143. These customs practiced in western Europe are considered by Hajnal to be "unique or almost unique in the world." p. 101.

which outpaced population growth and thus permitted a rise in the standard of living and the accumulation of capital within the economy. These factors, while not sufficient in themselves, might be considered necessary for the industrialization of England.<sup>54</sup> Japan, after a century of rapid economic development, might be considered to have been on an economic threshold similar to England's prior to her industrialization.

Why society seemed to act to limit population growth in both England and Japan remains unexplained. E. A. Wrigley suggests that "societies are unwilling to allow matters to reach a Malthusian extreme."<sup>55</sup> But this does not explain why some societies will limit population growth to what may be well above subsistence level, while others will in fact permit growth rates at levels which seem to threaten the very existence of the society. It may well be that the demographic factor is far more important in economic growth than has been recognized to date, and that societies to develop economically must develop social values which will inhibit population growth past certain limits.

In the twentieth century there are far more variables involved in economic growth, the relationships of which are becoming increasingly complex. However, a study of economic growth and demographic developments in both England and Japan prior to industrialization suggest that population was an extremely important factor in economic growth. Slow growth rates in both countries may have been partly fortuitous, but perhaps more crucially, the inhabitants of both countries directed their lives in such a way that the effect was to maximize their economic well-being and minimize the undesirable social and economic consequences of rapid population growth.

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<sup>54</sup> This hypothesis is expounded in Phyllis Deane and W. A. Cole, *British Economic Growth, 1688-1959*, Second Edition (Cambridge: Cambridge University Press, 1967), pp. 96-97.

<sup>55</sup> E. A. Wrigley, "Family Limitation in Pre-Industrial England," *Economic History Review*, 2nd Series, Vol. 19, No. 1 (1966), p. 109.