sponds to 5.6 bits of information. The goal may be either nectar, pollen, propolis, or nesting cavities (water being taken as merely dilute nectar)—2 bits of information. The quality of the goal is given by the unquantified "vigor" of the dance. This factor may be conservatively estimated as adding 2 bits of information. The dance also contains information about the odor of the food. Von Frisch (*3*) showed that bees could distinguish all 46 floral odors he had available. On another occasion, recruits successfully located the correct plants from among 700 other flowering species (*6*, p. 48). As a conservative estimate, the number of different odors will be taken to be 100—that is, 6.5 bits. From these estimates, the lower limit to the repertoire size of the dance is 25.4 bits, or $4 \times 10^7$ discrete "sentences." This is far higher than the value which can be calculated for any other known nonhuman system. The closest competition comes from the recent attempts to teach chimpanzees to use human language [for example, R. A. Gardner and B. T. Gardner, *Science* **165**, 664 (1969); D. M. Rumbaugh, T. V. Gill, E. C. von Glaserfeld, *ibid.* **182**, 731 (1973)]. If Washoe, for example, could use all of her 130-odd signs to form four-word sentences in the pattern noun-verb-modifier-noun, and if her repertoire of mostly nouns were actually to consist of 70 nouns, 30 verbs, and 30 modifiers, then $3.25 \times 10^6$ sentences would be theoretically possible. (Of course, only a fraction of these would make any sense; Lana's considerable aptitude in learning experiments may allow less crude estimates in the future.) The minimum equivalent figure for the repertoire size of a 10,000-word human vocabulary is more than $10^{22}$ seven-word sentences, or 74 bits.

38. A phenomenon admirably reviewed by D. R. Griffin [in *Animal Communication*, T. A. Sebeok, Ed. (Indiana Univ. Press, Bloomington, ed. 2, 1975)].

39. I thank N. E. Gary for technical advice, M. Brines for technical assistance, R. O'Connell for obtaining the scents, M. Rosetto for designing the electronics, J. Crane for lending the video tape equipment, and P. Marler, C. G. Gould, F. Nottebohm, and especially D. R. Griffin for their criticisms and encouragement. Supported in part by the Mary Flagler Cary Charitable Trust, Millbrook, New York.

# The American Birth Rate: Evidences of a Coming Rise

The proportion of young women who have not yet had any children is rising rapidly in this country.

June Sklar and Beth Berkov

With only one minor exception (in 1969 and 1970), the American birth rate dropped steadily after its peak in 1957. By 1973, the latest year for which nationwide data are available, the general fertility rate hit the lowest point ever recorded for it—69.2 live births per 1000 women aged 15 to 44 (*1*). The question naturally emerges, How long will the decline or the low rate already reached continue?

A tentative answer to this question is suggested by an examination of recent data from the state of California. As a result of a cooperative research project between the University of California, Berkeley, and the California Department of Health, more recent birth information is available for that state than for the country generally, permitting study of current fertility trends by legitimacy status, race, age, and parity of mother (*2*). Because it was one of the first states to liberalize abortion laws and to show high rates of legal abortion, we can also include in our investigation the impact of abortion. Our analysis is based on final birth figures through 1973 and estimates for 1974 derived from counts of all birth records in that year except for a small number of late filings. We examine also recent birth information from four other states where, as in California, the potential for complete fertility control has been enhanced through the widespread availability and use of legal abortion (*3*). Selected data for the United States as a whole are presented for comparative purposes.

This examination suggests that the decline in the nation's birth rate is coming to a halt and that an upturn is in the making. To begin with, the proportion of childless young women is now very high, and there is evidence that they do not desire to remain childless permanently. To reach their reproductive goals, they will have to begin their families soon. Evidence that young women may be starting to make up for lost time is provided in the latest data for California. There, despite somewhat adverse economic conditions, birth rates rose in 1974. Further, in California and the United States as a whole, contrary to the original expectations of some observers, liberalized abortion has had only a small effect on legitimate fertility and has not stopped the upward trend in illegitimate births. To understand why the country may now be entering a period of rising fertility requires an examination of the reasons why fertility fell in the first place.

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## The Fall in Fertility

As is well known, the fall in the general fertility rate after 1957 was not expected to continue into the late 1960's and early 1970's, because during that period the large cohorts of women born during the baby boom of the 1940's and 1950's would be in or coming into the age bracket 15 to 24, in which more than half of all births occur. The proportion of all women in the childbearing ages who were in this age group rose substantially after 1960 (Table 1). Yet, except for the slight rise in 1969 and 1970 (which is discussed later), the general fertility rate continued falling rapidly in the late 1960's and early 1970's in both California and the nation generally (Fig. 1).

In part, the drop came from a declining marriage rate among the young. During the years that the number of women aged 15 to 24 was increasing, the proportion who were marrying at those ages was declining (Table 2). In California the percentage of single (never-married) women in the age bracket 20 to 24 rose from 24.5 in 1960 to 37.9 in 1973; in the United States as a whole it rose from 28.4 to 38.3. At the same time there was a steady rise in the proportions of women whose marriages had been disrupted (Table 2). In California the percentage of divorced, widowed, and separated women aged 25 to 44 increased from 9.7 in 1960 to 13.8 in 1973. As a result of both these influences, the percentage of women of childbearing age in California who were currently married and living with their husbands fell from 71.1 to 58.9 between 1960 and 1973.

To determine how much of the decline in the general fertility rate could be attributed to changes in the proportion of women married and living with their husbands, we applied the 1973 age-specific legitimate and illegitimate birth rates to the population of married and unmarried women that would have existed in California in 1973 if the percent unmarried in each age group had remained at the 1960 level. This

Table 1. Percent of all women of childbearing age (15 to 44) in the age bracket 15 to 24, in 1960, 1966, and 1973. [Data from (*16; 21; 22; 23*, p. 64; *24*)]

| Year | California | United States |
|---|---|---|
| 1973 | 41.0 | 42.5 |
| 1966 | 38.0 | 39.9 |
| 1960 | 31.4 | 33.6 |

standardized rate for marital status showed that the decline in the proportion married accounted for about one-fourth of the drop in general fertility in California between 1960 and 1973. The illegitimate birth rate did not decrease during this period; most of the drop in general fertility came from a reduction in the fertility of currently married women.

It is not possible to calculate birth rates separately for married and unmarried women in California before 1966, but the trend in overall fertility—most of which is legitimate—shows that, except for small rises in 1969 and 1970, marital birth rates must have been dropping since at least 1960 (see Fig. 1). Data on marital fertility, available for California beginning in 1966, show that the decline in the legitimate birth rate was particularly sharp after 1970 (Table 3 and Fig. 2). In 1973 the legitimate birth rate was 94.3, or 23 percent below the 1966 rate of 122.4. This decline occurred in each age group, with women aged 35 to 44 showing the largest percentage drop.

The decline in marital fertility had several sources. First, women's desires and expectations shifted toward a smaller family size. Among American wives aged 18 to 39, for example, the average number of children expected by the completion of childbearing fell from 3.1 in 1967 to 2.6 in 1973 (*4*). Second, with the decline in marriage after 1960, there was a decrease in the proportion of all married women who were newly married. This depressed the marital fertility rate because newly married women are more likely to have babies than are the longer-married, many of whom have already completed their families.

A final influence in the decline in marital fertility was a change in the timing and spacing of births. Many women still have children relatively soon after marriage, but this tendency has lessened in recent years. For white women in the United States as a whole, the proportion having a first birth within 18 months of marriage declined from 60.3 percent for those first married in 1955–1959 to 52.1 percent for those first married in 1965–1969 (*5*). Comparable data are not yet available for more recent years, but the proportion probably has dropped further. The tendency not to have children so soon after marriage is reflected

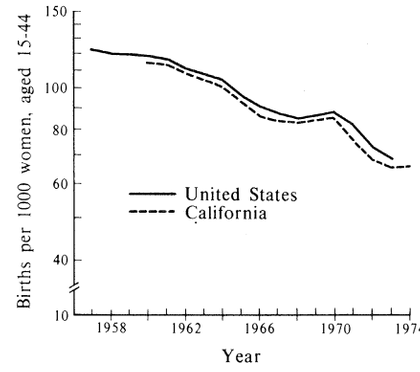


Fig. 1. General fertility rates for the United States, 1957 to 1973, and California, 1960 to 1974. California rates for 1957 to 1959 are not shown because comparable data are not available. [Data from (*1, 2*) and Table 3]

in California data which show that between 1966 and 1973 birth rates dropped by one-third for wives aged 20 to 24 and by one-fourth for wives aged 25 to 34 (Table 3).

While many young married women were refraining from childbearing during the late 1960's and early 1970's, older married women increasingly were those who, having participated in the baby boom, had completed their families at relatively young ages. In California, the fertility of wives aged 35 to 44 dropped by more than 40 percent between 1966 and 1973 (Table 3). This was primarily a drop in third and higher-order births (Table 4), reflecting the probability that on the average women in this age group had had all the children they planned to have. Data for the United States indicate that as a group married women aged 35 to 44 in 1973 already had realized their average expected family size of 3.2 children (*6*). These women had borne most of their children during the time when marriage occurred relatively early and births were spaced relatively closely (*7*).

The largest drop in California's marital fertility coincided with the period when legal abortion became widely available in the state, that is, since 1970. Little of this drop, however, can be attributed to increased use of legal abortion. Although legal abortion exerted a depressive influence on overall fertility—more in California than in the United States as a whole—our previous studies have shown that its impact was mainly on illegitimate births and could not have accounted for most of the accelerated decline in legitimate births (*2, 3*). Among married women teenagers were the only group whose rates were influenced substantially by legal abortion. The marital fertility rate changed little in that age group between 1966 and 1970 in California, but with the increased use of legal

Table 2. Marital status of women in the childbearing ages, United States and California, 1950 to 1974. [Data from (*22; 23*, p. 539; *25; 26*)]

| Year | United States | | | California | | |
|---|---|---|---|---|---|---|
| | Currently married | Currently unmarried | | Currently married | Currently unmarried | |
| | | Single | Divorced, separated, widowed | | Single | Divorced, separated, widowed |
| | | | *Ages 15 to 44* | | | |
| 1974 | 59.5 | 31.8 | 8.7 | 58.2 | 32.9 | 10.0 |
| 1973 | 60.5 | 31.4 | 8.0 | 58.9 | 32.0 | 9.8 |
| 1970 | 61.1 | 31.4 | 7.5 | 60.3 | 30.2 | 9.5 |
| 1960 | 69.2 | 24.5 | 6.3 | 71.1 | 21.1 | 7.8 |
| 1950 | 68.5 | 25.1 | 6.4 | 71.9 | 19.9 | 8.2 |
| | | | *Ages 15 to 19* | | | |
| 1974 | 11.4 | 87.7 | 0.9 | 9.1 | 89.7 | 1.3 |
| 1973 | 11.7 | 87.7 | 0.6 | 9.7 | 89.0 | 1.3 |
| 1970 | 10.8 | 88.1 | 1.1 | 11.0 | 87.7 | 1.3 |
| 1960 | 15.1 | 83.9 | 1.0 | 17.5 | 81.1 | 1.4 |
| 1950 | 16.0 | 82.9 | 1.1 | 18.5 | 80.0 | 1.5 |
| | | | *Ages 20 to 24* | | | |
| 1974 | 54.4 | 39.6 | 6.0 | 52.6 | 39.1 | 8.3 |
| 1973 | 55.5 | 38.3 | 6.2 | 53.9 | 37.9 | 8.1 |
| 1970 | 57.9 | 36.3 | 5.8 | 56.5 | 35.7 | 7.8 |
| 1960 | 67.2 | 28.4 | 4.4 | 69.4 | 24.5 | 6.1 |
| 1950 | 63.3 | 32.3 | 4.4 | 66.8 | 27.5 | 5.7 |
| | | | *Ages 25 to 44* | | | |
| 1974 | 79.5 | 7.9 | 12.6 | 77.2 | 8.5 | 14.1 |
| 1973 | 80.8 | 7.4 | 11.8 | 77.8 | 8.3 | 13.8 |
| 1970 | 81.6 | 7.9 | 10.5 | 79.0 | 7.9 | 13.1 |
| 1960 | 84.5 | 7.3 | 8.2 | 84.3 | 6.0 | 9.7 |
| 1950 | 81.9 | 9.9 | 8.2 | 82.6 | 7.8 | 9.6 |

abortion it dropped by 8 percent in 1971 and continued to fall, though at a reduced pace, in 1972 and 1973 (Table 3). Teenagers, however, constitute only a small proportion of all married women in the childbearing ages; consequently their fertility is not a major influence on the legitimate birth rate. For California it was not possible to estimate how much of the accelerated decline in marital fertility was accounted for by legal abortion, but for the United States we estimated that between 1970 and 1971 it accounted for only about one-fifth of the decline.

The trend in nonmarital fertility differs from that just described for married women (Fig. 2). In the United States, the illegitimate birth rate generally rose between the late 1950's and 1970. We have shown for California, where data are available only since 1966, that this rise was temporarily cut short in 1971 by the widespread use of legal abortion by unmarried women (Table 5) (*2*). Between 1970 and 1971 the illegitimacy rate dropped as much as it had risen in the previous 5 years. It continued to decline in 1972, but in 1973 it reversed itself, rising to 22.2, or very close to the 1966 rate (Table 3 and Fig. 2). The small net change did not contribute to the downward trend in overall fertility in the late 1960's and early 1970's. Moreover, a renewed rise in illegitimate reproduction occurred among some age groups of women, teenagers in particular. That it occurred despite continued high rates of legal abortion suggests that legal abortion will not keep the illegitimate birth rate from rising.

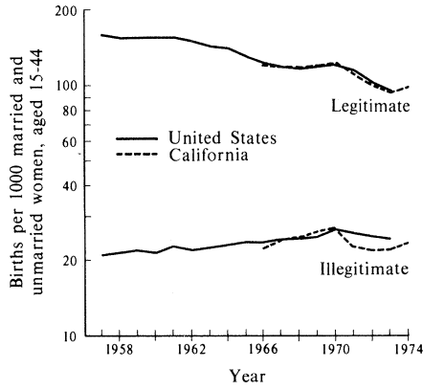


Fig. 2. Estimated legitimate and illegitimate birth rates for the United States, 1957 to 1973, and California, 1966 to 1974 (*31*).

## A Renewed Rise in Reproduction

In 1974 California's general fertility rate rose by 2.3 percent to 66.3 (Fig. 1). Live births rose from 297,834 in 1973 to an estimated 311,650 in 1974. Does this rise signal the start of a trend, or is it a temporary reversal such as occurred in 1969 and 1970? Certain differences between conditions then and conditions in 1974 suggest that the 1974 rise was not simply a temporary reversal. First, in contrast to 1969 and 1970, the 1974 increase occurred in the face of high rates of legal abortion. Second, it occurred even though the economic outlook in the period affecting 1974 births was markedly worse than in the period affecting 1969 and 1970 births (*8*). Third, it occurred even though there had been no increase in the marriage rate. The rise in the birth rate in 1969 and 1970 had been preceded by rises in first marriage rates; this was not true in 1974. In fact, first marriage rates in California declined by 8 percent between 1972 and 1973, one of the largest decreases since 1960, the first year for which those rates are available for the state (*9, 10*). For the United States as a whole, there was a continued rise through 1974 in the proportion of women in the childbearing ages who were single or whose marriages had been disrupted (Table 2).

Finally, by 1974 the proportion of childless married women had reached very high levels: almost one-third of all women under age 30 who had ever been married had not borne any children. This was in sharp contrast to 1970, when the proportion was about one-quarter, and to 1960, when it was only one-fifth (*11, 12*). It is not likely that such large proportions of married women will remain childless. Recent surveys have documented the aversion of most Americans to childlessness or even the one-child family (*13*). Most women, including those under 30, want and expect to have families of at least two children. In a national sample of white college women interviewed in 1971, only 13 percent said they wanted no children or only one child; 49 percent wanted two children and 38 percent wanted three or more (*13*). The Current Population Survey showed that among all married women under age 30 in 1974 only 16 percent expected to have no children or only one child; 54 percent expected to have two children and 30 percent expected to have three or more (*12*, p.17). Among childless married women under age 30 in 1974, more than three-fourths expected to have two or more children by the

Table 3. Estimated fertility rates by legitimacy status and age of mother, California residents, 1966 to 1974. Total rates are live births per 1000 women; legitimate rates are live births per 1000 married women; illegitimate rates are live births per 1000 unmarried (single, widowed, divorced, and separated) women. [Data from (*16*; *23*, p. 538; *24*; *26–28*)]

| Year | Age of mother | | | | |
|---|---|---|---|---|---|
| | 15-44* | 15-19 | 20-24 | 25-34 | 35–44† |
| | | | *All live births* | | |
| 1974‡ | 66.3 | 54.0 | 114.3 | 82.8 | 13.1 |
| 1973 | 64.8 | 53.5 | 113.0 | 80.6 | 13.1 |
| 1972§ | 68.2 | 55.8 | 121.9 | 84.9 | 14.1 |
| 1971§ | 75.1 | 58.4 | 139.6 | 93.2 | 16.1 |
| 1970 | 84.6 | 68.8 | 158.0 | 106.1 | 18.1 |
| 1969 | 83.9 | 67.6 | 161.1 | 105.8 | 18.6 |
| 1968 | 82.7 | 68.2 | 164.4 | 103.0 | 19.2 |
| 1967 | 83.9 | 70.5 | 172.8 | 103.6 | 20.9 |
| 1966 | 86.3 | 72.7 | 184.1 | 107.9 | 22.5 |
| | | | *Legitimate births* | | |
| 1974‡ | 96.6 | 364.3 | 186.0 | 101.0 | 15.1 |
| 1973 | 94.3 | 348.1 | 181.4 | 98.0 | 15.1 |
| 1972§ | 99.6 | 357.1 | 195.2 | 102.9 | 16.2 |
| 1971§ | 110.3 | 374.7 | 223.5 | 112.9 | 18.6 |
| 1970 | 122.1 | 409.6 | 247.9 | 127.6 | 20.7 |
| 1969 | 120.1 | 390.8 | 248.2 | 126.6 | 21.4 |
| 1968 | 117.7 | 388.9 | 249.8 | 122.6 | 22.0 |
| 1967 | 119.1 | 399.2 | 259.3 | 122.5 | 23.8 |
| 1966 | 122.4 | 410.6 | 272.9 | 127.0 | 25.8 |
| | | | *Illegitimate births* | | |
| 1974‡ | 23.7 | 22.3 | 33.6 | 24.7 | 5.7 |
| 1973 | 22.2 | 21.1 | 32.0 | 22.8 | 5.5 |
| 1972§ | 22.1 | 20.8 | 31.5 | 23.4 | 5.5 |
| 1971§ | 22.6 | 20.4 | 33.4 | 25.0 | 6.1 |
| 1970 | 27.0 | 24.1 | 41.3 | 29.9 | 7.2 |
| 1969 | 26.0 | 22.8 | 41.6 | 28.9 | 7.0 |
| 1968 | 24.6 | 21.1 | 41.0 | 27.8 | 7.1 |
| 1967 | 23.8 | 20.0 | 40.3 | 28.2 | 7.7 |
| 1966 | 22.5 | 18.2 | 40.4 | 28.8 | 7.3 |

*Rates computed by relating total births, regardless of age of mother, to estimated number of women aged 15 to 44. †Rates computed by relating births to mothers aged 35 and over to estimated number of women aged 35 to 44. ‡Data for 1974 are derived from counts of all birth records in that year except for a small number of late filings. §Rates for 1971 and 1972 may differ slightly from those published previously because of changes in denominators in order to use more recent information.

end of their childbearing period. These figures indicate that for the most part currently childless young women have postponed but do not plan to give up having children. If these young women are to realize their desires and expectations with respect to family size, they cannot postpone childbearing much longer. Within the next few years many will have to begin "making up" the births they delayed in previous years.

Table 4. Estimated legitimate and illegitimate birth rates by age of mother and live birth order, California residents, 1966, 1970, 1973, 1974. Legitimate rates are births per 1000 married women; illegitimate rates are births per 1000 unmarried (single, widowed, divorced, and separated) women. [Data from (*16*; *23*, p. 538; *24*; *26–28*)]

| Year | Legitimate | | | | Illegitimate | | | |
|---|---|---|---|---|---|---|---|---|
| | Total live births | Birth order | | | Total live births | Birth order | | |
| | | 1 | 2 | 3+ | | 1 | 2 | 3+ |
| | | | | *Ages 15 to 44** | | | | |
| 1974† | 96.6 | 39.2 | 32.5 | 24.9 | 23.7 | 14.2 | 4.7 | 4.8 |
| 1973 | 94.3 | 38.3 | 31.1 | 24.9 | 22.2 | 13.4 | 4.3 | 4.5 |
| 1970 | 122.1 | 46.6 | 36.5 | 39.0 | 27.0 | 16.2 | 4.6 | 6.2 |
| 1966 | 122.4 | 41.4 | 32.8 | 48.2 | 22.5 | 12.6 | 3.6 | 6.3 |
| | | | | *Ages 15 to 19* | | | | |
| 1974† | 364.3 | 281.3 | 73.0 | 10.0 | 22.3 | 18.9 | 2.9 | 0.5 |
| 1973 | 348.1 | 273.0 | 66.2 | 8.9 | 21.1 | 18.0 | 2.7 | 0.4 |
| 1970 | 409.6 | 320.2 | 77.4 | 12.0 | 24.1 | 20.6 | 3.0 | 0.5 |
| 1966 | 410.6 | 307.3 | 84.5 | 18.8 | 18.2 | 15.2 | 2.4 | 0.6 |
| | | | | *Ages 20 to 24* | | | | |
| 1974† | 186.0 | 91.0 | 69.8 | 25.2 | 33.6 | 17.2 | 9.8 | 6.6 |
| 1973 | 181.4 | 88.3 | 67.9 | 25.2 | 32.0 | 16.6 | 8.9 | 6.5 |
| 1970 | 247.9 | 116.3 | 90.3 | 41.3 | 41.3 | 22.6 | 10.1 | 8.6 |
| 1966 | 272.9 | 113.5 | 95.8 | 63.6 | 40.4 | 21.0 | 9.1 | 10.3 |
| | | | | *Ages 25 to 34* | | | | |
| 1974† | 101.0 | 28.0 | 36.6 | 36.4 | 24.7 | 6.6 | 5.4 | 12.7 |
| 1973 | 98.0 | 26.5 | 34.7 | 36.8 | 22.8 | 5.8 | 4.8 | 12.2 |
| 1970 | 127.6 | 28.0 | 38.2 | 61.4 | 29.9 | 6.5 | 5.0 | 18.4 |
| 1966 | 127.0 | 20.9 | 31.6 | 74.5 | 28.8 | 4.7 | 4.2 | 19.9 |
| | | | | *Ages 35 to 44‡* | | | | |
| 1974† | 15.1 | 1.7 | 2.6 | 10.8 | 5.7 | 0.8 | 0.6 | 4.3 |
| 1973 | 15.1 | 1.7 | 2.5 | 10.9 | 5.5 | 0.7 | 0.6 | 4.2 |
| 1970 | 20.7 | 1.8 | 2.7 | 16.2 | 7.2 | 0.6 | 0.6 | 6.0 |
| 1966 | 25.8 | 1.8 | 2.9 | 21.1 | 7.3 | 0.6 | 0.6 | 6.1 |

*Rates computed by relating total births, regardless of age of mother, to estimated number of women aged 15 to 44. †Data for 1974 are derived from counts of all birth records in that year except for a small number of late filings. ‡Rates computed by relating births to mothers aged 35 and over to estimated number of women aged 35 to 44.

## Evidence on Marital Fertility

When we examine the course of marital fertility in 1974, and how the pattern differed by age and parity of mother in that year, we find evidence that making up actually was occurring. After dropping to a historic low in 1973, the legitimate birth rate in California rose slightly in 1974 to 96.6 (Fig. 2), with increases occurring in each age group under 35 (Table 3).

Among women aged 25 to 34 the legitimate birth rate rose by 3 percent in 1974 to 101.0. However, the rise was only in first and second births. Moreover, this rise had been occurring for some time. As Table 4 and Fig. 3 show, wives aged 25 to 34 were the only age group to have increasing rates of first and second births between 1966 and 1974; in all other age groups these rates dropped overall during this period. Thus it appears that as women entered their late 20's and early 30's they were beginning to make up the births they had postponed.

For women aged 20 to 24, first and second birth rates dropped between 1966 and 1973, but then rose in 1974. Between 1966 and 1973, the legitimate birth rate for women in this age group tumbled by 34 percent to its lowest recorded point, 181.4. This was the greatest relative decline in any age group except 35-and-over. In 1974, however, the rate rose by 3 percent. This

Table 5. Estimated legal abortion rates by marital status, race, and age of women California residents, 1971–72 to 1973–74. Rates are per 1000 married, unmarried (single, widowed, divorced, and separated), and total women. Years extend from July of one year through June of the next. [Data from (*29*)]

| Age | All races | | | White | | | Black | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1971–72 | 1972–73 | 1973–74 | 1971–72 | 1972–73 | 1973–74 | 1971–72 | 1972–73 | 1973–74 |
| | | | | | *All marital statuses* | | | | |
| 15–44* | 25.6 | 27.0 | 27.6 | 22.9 | 24.9 | 24.8 | 53.2 | 55.2 | 57.6 |
| 15–19 | 38.4 | 42.7 | 45.0 | 35.3 | 40.7 | 42.0 | 72.4 | 78.0 | 85.1 |
| 20–24 | 39.9 | 42.3 | 42.7 | 35.1 | 38.3 | 37.6 | 90.4 | 96.5 | 101.7 |
| 25–34 | 21.9 | 21.8 | 21.8 | 19.4 | 19.9 | 19.3 | 44.5 | 42.2 | 41.9 |
| 35–44† | 7.4 | 7.3 | 7.1 | 6.6 | 6.7 | 6.3 | 12.5 | 13.6 | 12.8 |
| | | | | | *Married* | | | | |
| 15–44* | 11.5 | 11.8 | 11.8 | 10.2 | 10.8 | 10.6 | 24.3 | 23.2 | 21.7 |
| 15–19 | 26.0 | 28.6 | 32.1 | 23.5 | 27.4 | 30.5 | 51.5 | 44.1 | 45.3 |
| 20–24 | 16.8 | 18.0 | 18.8 | 14.7 | 16.4 | 16.8 | 40.3 | 39.3 | 40.8 |
| 25–34 | 12.7 | 12.5 | 12.3 | 11.3 | 11.3 | 10.9 | 25.5 | 23.4 | 20.3 |
| 35–44† | 5.7 | 5.7 | 5.3 | 5.1 | 5.2 | 4.6 | 9.5 | 10.3 | 9.2 |
| | | | | | *Unmarried* | | | | |
| 15–44* | 46.4 | 49.2 | 50.0 | 42.5 | 46.6 | 46.1 | 77.4 | 81.6 | 86.0 |
| 15–19 | 39.9 | 44.3 | 46.4 | 36.8 | 42.2 | 43.2 | 74.6 | 81.4 | 88.7 |
| 20–24 | 68.8 | 71.8 | 70.4 | 62.2 | 66.7 | 63.2 | 132.2 | 143.0 | 148.5 |
| 25–34 | 53.4 | 53.3 | 52.9 | 49.8 | 51.8 | 49.3 | 71.6 | 68.5 | 70.9 |
| 35–44† | 14.2 | 13.8 | 13.8 | 13.3 | 13.0 | 13.1 | 17.0 | 18.5 | 18.0 |

*Rate relates legal abortions for women of all ages to estimated women aged 15 to 44. †Rate relates legal abortions for women aged 35 and over to estimated women aged 35 to 44.

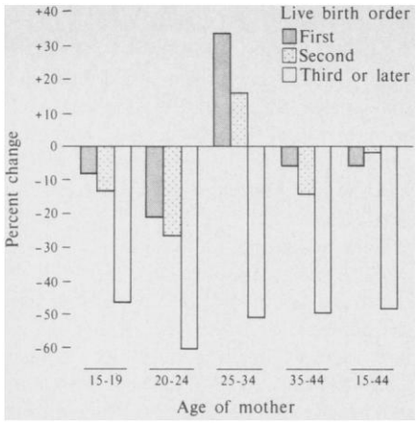


Fig. 3. Percent change between 1966 and 1974 in legitimate birth rates by age of mother and birth order, California. [Data from Table 4]

increase is relatively small, but it is the first recorded for this age bracket since data became available in California in 1966.

Teen-agers also contributed to the 1974 rise in marital reproduction. The high marital fertility rates among teen-agers in the late 1960's had been slowed down in the early 1970's by high rates of legal abortion but rose in 1974 by 5 percent, more than in any other age group (Table 3).

In light of recent developments with respect to the fertility of married women in the key reproductive ages in California, the legitimate birth rate appears poised for an upward climb. Tempering the upward influences, perhaps, will be unfavorable economic conditions, if they persist. Women who postponed childbearing in their early 20's and are currently in their late 20's and early 30's are in a particularly severe bind: the financial climate is not favorable toward having children, but if they are to have the number they wish they must start soon. On the basis of California's recent experience, there is evidence that an unfavorable economic outlook will not necessarily prevent these women from going ahead.

## Evidence on Nonmarital Fertility

Illegitimate fertility also contributed to the rise in overall birth rates in California in 1974 (Table 3 and Fig. 2). As noted previously, the illegitimate birth rate had started rising in 1973. It rose again in 1974, reaching 23.7, or above the 1966 level. Teen-agers, who had accounted for most of the increase between 1966 and 1970, also were responsible for most of the renewed rise. Rates of older groups of women also rose in 1974, though generally less than that of teen-agers.

The renewed rises in illegitimate fertility occurred despite high rates of legal abortion among unmarried women. The legal abortion rate for unmarried women in the childbearing ages reached almost 50 per 1000 in the period affecting 1973 and 1974 births (Table 5). Teenagers, who had the largest and most consistent increases in illegitimate fertility after 1971, also showed the largest relative increase in legal abortion rates.

These facts indicate that there are motivational and situational factors that compensate for, and in some cases even overcome, the downward pressures exerted by legal abortion. The forces supporting out-of-wedlock childbearing at relatively high levels are evidently particularly marked among teenagers. Their rate has risen 3 years in a row despite increasing availability of contraception and rising use of legal abortion. In previous papers we have discussed some of the reasons why teenagers appear to be deliberately choosing unwed motherhood, especially those reasons relating to the change in the penalties and rewards surrounding childbearing outside of wedlock (*10, 14*). This change also may be influencing older women, who recently have been showing rises in illegitimate fertility. Because of the decline in marriage and the rise in marital disruption, there now are more unmarried women in or near their 30's than formerly. Many of them may see little prospect of marriage or do not wish to marry, but it may be that, like childless married women of the same age, they do wish to have children and recognize that they cannot postpone childbearing indefinitely. In sum, there is evidence that out-of-wedlock childbearing probably will continue at relatively high levels in the next few years.

Table 6. Estimated legitimate and illegitimate birth rates* for women aged 15 to 44, New York, Hawaii, Washington, and Oregon, 1965 to 1973 (*30*). Legitimate rates are births per 1000 married women; illegitimate rates are births per 1000 unmarried (single, widowed, divorced, and separated) women.

| Year | New York | Hawaii | Washington | Oregon |
|---|---|---|---|---|
| | | *Legitimate* | | |
| 1973 | 92.1 | 122.2 | 91.8 | 98.4 |
| 1972 | 100.1 | 126.6 | 95.0 | 102.3 |
| 1971 | 114.0 | 133.2 | 111.1 | 111.8 |
| 1970 | 126.9 | 139.4 | 123.1 | 119.9 |
| 1969 | 125.8 | 134.8 | 123.7 | 115.7 |
| 1968 | 124.2 | 127.8 | 122.2 | 112.4 |
| 1967 | 128.6 | 132.6 | 120.2 | 112.6 |
| 1966 | 135.8 | 136.9 | 115.1 | 118.8 |
| 1965 | 142.8 | 153.0 | 119.2 | 122.0 |
| | | *Illegitimate* | | |
| 1973 | 21.4 | 22.8 | 13.9 | 14.2 |
| 1972 | 21.7 | 20.9 | 13.8 | 14.4 |
| 1971 | 22.9 | 21.0 | 17.0 | 15.3 |
| 1970 | 27.6 | 24.6 | 21.0 | 17.9 |
| 1969 | 26.2 | 24.4 | 20.7 | 19.4 |
| 1968 | 24.5 | 22.9 | 18.7 | 18.2 |
| 1967 | 23.5 | 22.2 | 17.2 | 17.3 |
| 1966 | 22.6 | 22.1 | 16.5 | 16.1 |
| 1965 | 21.7 | 21.6 | 15.2 | 16.1 |

*Rates computed by relating total births, regardless of age of mother, to estimated number of women aged 15 to 44.

Table 7. Births per 1000 women California residents aged 15 to 44, by race, 1960, 1966, and 1974. [Data from (*23*, p. 473; *28*) and Table 8]

| Year | White | Black | Percent black rate exceeds white rate |
|---|---|---|---|
| 1974 | 66.3 | 73.1 | 10 |
| 1966 | 85.5 | 107.5 | 26 |
| 1960 | 112.2 | 151.9 | 35 |

## Evidence from Other States

Data for the period 1965 to 1973 from New York, Hawaii, Washington, and Oregon suggest that California's experience is indicative of trends in the nation generally. Like California, these states have had high rates of legal abortion since 1970, and they also show signs of the beginning of a "bottoming out" in marital fertility. Their legitimate birth rates generally dropped much less in 1973 than in either 1971 or 1972 and their illegitimate rates, after declining sharply in 1971, declined much less or rose in 1972 and 1973 (Table 6). As in California, much of the upward pressure came from teenagers. In each of the four states teenage illegitimate fertility rates were higher in 1973 than in 1965, a year when legal abortion was not an available option (*3, 15*).

If fertility is on the verge of a rise in the states with high abortion rates, it is likely that it also will rise in the other states. As we have shown in a previous paper the low-abortion states had less decline in both legitimate and illegitimate fertility in 1971 than states with high abortion rates, but they nevertheless followed the same trend (*3*). For states in both groups, precisely when the expected rise in fertility will occur and how long it will last will depend both upon economic conditions and upon the willingness of women to continue postponement of marriage and childbearing. On the basis of California's experience in 1974, one may conclude that, in the other states as well, growing numbers of women may be ready to bear children regardless of economic conditions.

## Race Differences in Future Fertility Trends

Nearly 90 percent of women in the childbearing ages in California are white. Consequently, the trend and pattern in fertility

for the state primarily reflects the reproductive behavior of white women. The pattern among blacks, who in 1974 comprised 8 percent of women in the childbearing ages in California, shows some marked differences from that of whites (*16*). Their fertility historically has been much higher than white fertility but in recent years has been falling much more rapidly. As a result, rates for the two groups have converged considerably (Table 7). But black women have continued to start childbearing much earlier than white women, and despite the recent rapid decline in black fertility, it appears likely that they too will contribute to an upturn in the birth rate.

The convergence of California's black and white fertility rates in 1974 was due primarily to the very rapid decline in black marital fertility (Table 8 and Fig. 4). Between 1966 and 1974 the black legitimate birth rate dropped by more than two-fifths (from 144.5 to 83.0), much more than that of whites. Indeed, whereas in 1966 the black marital fertility rate was substantially above the white (144.5 versus 121.9), by 1974 it was substantially below the white (83.0 versus 98.0). This reversal characterized each age group. The decline came largely from a steep drop in third and higher-order births (Table 9), although these still remained greater for blacks than for whites. It was the rates of legitimate first and second births that were lower. This was true in virtually all age groups.

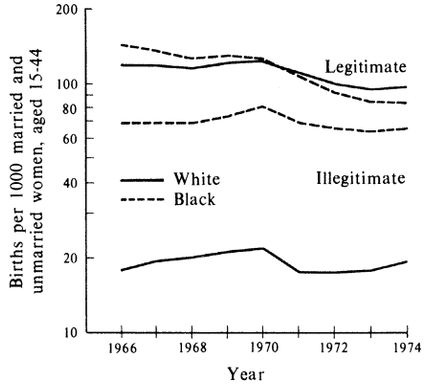


Fig. 4. Estimated birth rates by legitimacy status for white and black women, California, 1966 to 1974. [Data from Table 8]

The rate of first marital births had been lower for blacks even in 1966, reflecting the fact that a higher proportion of black women start childbearing in their teens before marriage. Cumulative first birth rates we have estimated for California show that of women who were age 19 in 1974, 42 percent of the blacks and 21 percent of the whites had had a first child; 33 percent of the black 19-year-olds and 6 percent of the white had had a first child out of wedlock (*17*). There is little question that many black women who marry in their 20's have had a child previously. Accordingly, despite their current low marital birth rates, black women continue to show somewhat higher overall fertility than whites. Their completed family size also remains larger. In 1974, the average number of children ever born to currently married women in the United States was higher for blacks than for whites in each age group. Of those aged 35 to 39, on the average black women had had 3.6 children, white women 3.0 children (*12*, p. 15).

Both black and white nonmarital fertility, after rising between 1966 and 1970, declined sharply in 1971 because of increased use of legal abortion. In 1972 rates for both races declined again but at a reduced pace (Table 8). In 1973, however, while the illegitimate rate for blacks continued dropping, the rate for whites began a renewed rise that continued through the following year. In 1974 the white rate reached 19.2, or 6 percent above what it had been in 1966; the black rate also rose, reaching 65.3, or 6 percent below what it had been in 1966. Between 1966 and 1974, then, the black rate dropped by the same amount that the white rate rose. Nevertheless, the difference between them still was great (Table 8 and Fig. 4). In 1974 the illegitimate rate of blacks was more than three times that of whites. Further, the much higher illegitimacy levels for blacks applied to each age group.

The decline in black illegitimate rates in previous years resulted in large part from a drop in higher-order births; the black rate for first and second illegitimate births was higher in 1974 than in 1966 (Table 9). Detailed data not presented in this report

Table 8. Estimated birth rates by legitimacy status and age and race of mother, California residents, 1966 and 1970–1974. Legitimate rates are births per 1000 married women; illegitimate rates are births per 1000 unmarried (single, widowed, divorced, and separated) women. [Data from (*16*; *23*, p. 538; *24*; *26–28*)]

| Year | White | | | | | Black | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 15–44* | 15–19 | 20–24 | 25–34 | 35–44† | 15–44* | 15–19 | 20–24 | 25–34 | 35–44† |
| | | | | | *All live births* | | | | | |
| 1974‡ | 66.3 | 51.5 | 115.2 | 83.8 | 12.9 | 73.1 | 98.8 | 135.2 | 61.7 | 11.5 |
| 1973 | 64.6 | 50.6 | 113.5 | 81.6 | 13.0 | 73.4 | 102.0 | 135.9 | 60.1 | 12.1 |
| 1972§ | 67.8 | 52.8 | 122.5 | 85.6 | 13.6 | 78.2 | 106.1 | 142.0 | 67.0 | 14.1 |
| 1971§ | 74.6 | 55.2 | 140.5 | 93.8 | 15.7 | 87.9 | 112.2 | 160.5 | 79.0 | 17.8 |
| 1970 | 84.1 | 65.1 | 159.3 | 106.8 | 17.5 | 101.6 | 133.2 | 182.4 | 93.6 | 20.6 |
| 1966 | 85.5 | 69.5 | 186.5 | 107.2 | 21.9 | 107.5 | 139.0 | 200.0 | 110.8 | 26.0 |
| | | | | | *Legitimate* | | | | | |
| 1974‡ | 98.0 | 376.7 | 188.7 | 101.3 | 14.7 | 83.0 | 287.8 | 171.0 | 75.7 | 14.4 |
| 1973 | 95.5 | 356.7 | 183.4 | 98.5 | 14.8 | 84.3 | 303.4 | 171.0 | 74.8 | 15.2 |
| 1972§ | 100.5 | 366.6 | 196.8 | 102.9 | 15.7 | 92.6 | 303.3 | 186.3 | 84.6 | 17.5 |
| 1971§ | 111.1 | 382.3 | 225.2 | 112.8 | 18.0 | 109.0 | 344.6 | 218.4 | 99.8 | 22.7 |
| 1970 | 122.8 | 418.1 | 249.5 | 127.4 | 20.0 | 126.4 | 405.2 | 254.4 | 117.0 | 26.2 |
| 1966 | 121.9 | 410.6 | 274.6 | 125.7 | 25.1 | 144.5 | 504.8 | 287.8 | 139.4 | 32.7 |
| | | | | | *Illegitimate* | | | | | |
| 1974‡ | 19.2 | 17.2 | 27.1 | 22.0 | 5.6 | 65.3 | 82.3 | 108.5 | 43.2 | 7.3 |
| 1973 | 17.7 | 15.8 | 25.3 | 20.2 | 5.3 | 64.5 | 82.6 | 108.2 | 40.0 | 7.4 |
| 1972§ | 17.4 | 15.4 | 25.0 | 20.7 | 5.0 | 66.2 | 86.0 | 105.4 | 42.2 | 8.9 |
| 1971§ | 17.6 | 14.9 | 26.6 | 21.6 | 5.4 | 69.9 | 87.4 | 111.4 | 48.6 | 10.4 |
| 1970 | 21.6 | 17.9 | 34.2 | 26.0 | 6.4 | 80.1 | 102.0 | 123.5 | 58.5 | 12.2 |
| 1966 | 18.1 | 13.5 | 35.2 | 24.2 | 6.3 | 69.2 | 84.8 | 107.5 | 60.8 | 14.1 |

*Rates computed by relating total births, regardless of age of mother, to estimated number of women aged 15 to 44. †Rates computed by relating births to mothers aged 35 and over to estimated number of women aged 35 to 44. ‡Data for 1974 are derived from counts of all birth records in that year except for a small number of late filings. §Rates for 1971 and 1972 may differ slightly from those previously published because of changes in denominators in order to use more recent information.

show that this was true in almost every age group.

Because current illegitimate birth rates for both black and white women are not much different from those of 1966 while legitimate birth rates have dropped sharply since 1966, there has been a large increase in the proportion of all births that are out of wedlock. Among black women the proportion rose from 31.6 percent in 1966 to 50.2 in 1974, among white women from 7.4 to 11.7 (*18*).

Black-white differences in nonmarital fertility have persisted even though legal abortion rates have been about twice as high for blacks as for whites (Table 5). Adding illegitimate births to legal abortions for unmarried women, we obtain a recorded pregnancy rate in 1973–1974 of 151.3 for unmarried blacks, 65.3 for unmarried whites. In almost all age groups, recorded pregnancy rates for unmarried women were substantially higher for blacks than for whites, and a smaller proportion were terminated by legal abortion among black than among white women.

Since 1920, black fertility rates have tended to follow the same trend as white fertility rates, with the swings in the black rates being more extreme (*19*). Although the general fertility rate for black women did not rise between 1973 and 1974 as it did for white women, its decline was checked (Table 8); and despite high rates of legal abortion, the black illegitimate birth rate rose in 1974. It thus appears that black general fertility, like white general fertility, has stopped falling and that it probably will rise. Because of the prior high black birth rates, black women will continue to constitute an increasing proportion of all women in the childbearing ages. Thus black women, particularly if they continue to have larger families, may be expected to continue to exert upward pressure on the birth rate in California.

Table 9. Estimated birth rates by legitimacy status, live birth order, and race of mother, California residents, 1966, 1970, 1973, 1974. Legitimate rates are births per 1000 married women; illegitimate rates are births per 1000 unmarried (single, widowed, divorced, and separated) women. [Data from (*16*; *23*, p. 538; *24*; *26–28*)]

| Year | White | | | | Black | | | |
|---|---|---|---|---|---|---|---|---|
| | Total live births | Birth order | | | Total live births | Birth order | | |
| | | 1 | 2 | 3+ | | 1 | 2 | 3+ |
| | | | | *All live births** | | | | |
| 1974† | 66.3 | 28.7 | 21.1 | 16.5 | 73.1 | 32.4 | 20.9 | 19.8 |
| 1973 | 64.6 | 27.9 | 20.3 | 16.4 | 73.4 | 32.2 | 20.3 | 20.9 |
| 1970 | 84.1 | 34.6 | 24.0 | 25.5 | 101.6 | 39.2 | 26.1 | 36.3 |
| 1966 | 85.5 | 31.0 | 22.4 | 32.1 | 107.5 | 35.5 | 23.5 | 48.5 |
| | | | | *Legitimate** | | | | |
| 1974† | 98.0 | 39.9 | 33.0 | 25.1 | 83.0 | 28.0 | 28.1 | 26.9 |
| 1973 | 95.5 | 39.0 | 31.5 | 25.0 | 84.3 | 28.6 | 27.2 | 28.5 |
| 1970 | 122.8 | 47.5 | 36.8 | 38.5 | 126.4 | 37.0 | 36.7 | 52.7 |
| 1966 | 121.9 | 42.0 | 33.0 | 46.9 | 144.5 | 38.8 | 33.5 | 72.2 |
| | | | | *Illegitimate** | | | | |
| 1974† | 19.2 | 12.0 | 3.5 | 3.7 | 65.3 | 35.9 | 15.3 | 14.1 |
| 1973 | 17.7 | 11.2 | 3.1 | 3.4 | 64.5 | 35.2 | 14.6 | 14.7 |
| 1970 | 21.6 | 13.7 | 3.3 | 4.6 | 80.1 | 41.2 | 16.8 | 22.1 |
| 1966 | 18.1 | 10.9 | 2.6 | 4.6 | 69.2 | 32.2 | 13.2 | 23.8 |

*Rates computed by relating total births, regardless of age of mother, to estimated number of women aged 15 to 44. †Data for 1974 are derived from counts of all birth records in that year except for a small number of late filings.

## Summary and Conclusion

As demographers discovered long ago, forecasting the American birth rate can be a precarious undertaking. This is especially true when the nation is faced with social, economic, and political uncertainties and when significant changes apparently are occurring in sexual attitudes and behavior, women's roles, and the family. Given current attitudes which question the value of marriage and the family, it is tempting to assume that birth rates will remain low. But attitudes that are in fashion at a particular time tend to change with the times. The negative attitudes toward marriage and reproduction that characterized the late 1920's and 1930's were replaced by more favorable attitudes in the period following World War II and then turned more negative again in the 1960's. A swing back could occur again in the near future.

In our view there are certain demographic realities that are providing a stimulus for a renewed increase in birth rates. Evidence from various sources, especially recent detailed information from California, suggests that the low rate of legitimate fertility that persisted through the late 1960's and early 1970's was caused in large part by the postponement of marriage and childbearing among cohorts of young women, and that a period of rising marital fertility may be at hand during which they will make up the births they delayed. Nonmarital birth rates also are likely to increase, for even though legal abortion stopped the upward trend in illegitimate births in 1971, in California the rate of out-of-wedlock childbearing subsequently began a renewed rise, and in 1974 was above the 1966 rate. Legal abortion probably will prevent the illegitimate birth rate from rising as fast as it would if abortion were illegal or inaccessible, but the persistence of relatively high rates, and especially the increase in illegitimate births to teenagers, indicate that motivational and situational factors supporting out-of-wedlock childbearing remain strong.

Crucial in the future trend of the overall birth rate are the large cohorts of women born during the peak baby boom years of the middle and late 1950's. In the next half decade they will enter their 20's. If present reproductive patterns continue, by 1980 their entrance into the prime reproductive ages will raise fertility by 9 percent for the crude birth rate and 2 percent for the general fertility rate (*20*); and if they do not continue the present pattern of postponing marriage and childbearing, fertility will rise even more.

In sum, our evidence suggests that the American birth rate may have bottomed out and that the country is likely to see a rise in reproduction.

### References and Notes


1. *Monthly Vital Statistics Report*, vol. 23, No. 11, suppl. (National Center for Health Statistics, Rockville, Md., Jan. 1975), p. 6.
2. For discussion of sources and methods used to estimate California birth rates by legitimacy status, and for analysis of the impact of legal abortion on fertility in California, ➡ J. Sklar and B. Berkov, *Stud. Fam. Plann.* **4**, 281 (1973).
3. J. Sklar and B. Berkov, *Science* **185**, 909 (1974).
4. Bureau of the Census, *Current Population Reports* P-20, No. 269 (Government Printing Office, Washington, D.C., 1974), p. 4.
5. ———, *ibid.* P-20, No. 263, p. 53.
6. ———, *ibid.* P-20, No. 265, pp. 17, 31, 32.
7. J. Blake, *Eugen. Q.* **14**, 60 (19➡ P. Glick, *J. Marriage Fam.* **37**, 15 (1975).
8. In California the unemployment rate was 5.2 percent of the labor force in 1969 and 7.0 percent in 1973. In 1974 it rose still further to 7.3 percent. Whether this further slowdown of the economy will be reflected in the birth rate can only be ascertained when 1975 birth data become available. *California Statistical Abstract, 1974* (Department of Finance, California, Sacramento, 1974), p. 15; communication from Employment Data and Research Division, Employment Development Department, State of California.
9. The following are estimated rates of first marriages per 1000 single women for California in 1973:

| Age | Rate |
|---|---|
| 15–44 | 83.4 |
| 15–19 | 54.3 |
| 20–24 | 158.0 |
| 25–44 | 85.4 |

Sources for these estimates and data for 1960–1972 are given in (*10*).
10. J. Sklar and B. Berkov, *Fam. Plann. Perspect.* **6**, 84 (1974).
11. Bureau of the Census, *Census of Population: 1960* PC(2)–3A (Government Printing Office, Washing-

ton, D.C., 1964), p. 20; *Census of Population: 1970* PC(2)–3A (Government Printing Office, Washington, D.C., 1973), p. 26.

12. ———, *Current Population Reports* P-20, No. 277 (Government Printing Office, Washington, D.C., 1975), p. 30.
13. J. Blake, *Demography* **11**, 25 (1974).
14. P. Cutright, F. F. Furstenberg, Jr., J. Sklar, B. Berkov, *Fam. Plann. Perspect.* **6**, 132 (1974).
15. Estimated illegitimate births per 1000 unmarried women aged 15 to 19 are as follows:

| State | 1973 | 1965 |
|---|---|---|
| New York | 18.6 | 15.3 |
| Hawaii | 20.9 | 13.9 |
| Washington | 13.6 | 11.2 |
| Oregon | 14.2 | 12.8 |

Data were obtained by correspondence with state agencies. See also (*3*).

16. Department of Finance, State of California, population estimates prepared July 1974.
17. For methods used to estimate cumulative first birth rates and rates for three earlier cohorts, see (*10*, p. 89).
18. The number of live births and the number and proportion illegitimate for California residents in 1973 and 1974 were as follows:

| Race | Live births | | Percent illegitimate |
|---|---|---|---|
| | Total | Illegitimate | |
| | *1974 (provisional)* | | |
| All races | 311,650 | 46,247 | 14.8 |
| White | 270,153 | 31,552 | 11.7 |
| Black | 27,172 | 13,653 | 50.2 |
| | *1973* | | |
| All races | 297,834 | 41,851 | 14.1 |
| White | 258,390 | 28,168 | 10.9 |
| Black | 26,236 | 12,756 | 48.6 |

For 1966–1972 data see (*2*).

19. National Center for Health Statistics, *Natality Statistics Analysis*, Series 21, No. 19 (Government Printing Office, Washington, D.C., 1970), p. 12.
20. Estimate of rise to 1980 obtained by applying age-specific birth rates for the United States in 1973 to estimated population of the United States in 1980 using Series E projections which assume a completed family size of 2.1 children; see (*1*, pp. 6, 7) and Bureau of the Census, *Current Population Reports* P-25, No. 493 (Government Printing Office, Washington, D.C., 1972), p. 18.
21. Bureau of the Census, *Current Population Reports* P-25, No. 519 (Government Printing Office, Washington, D.C., 1974), pp. 12, 19.
22. ———, *Census of Population: 1960*, vol. 1, part 1 (Government Printing Office, Washington, D.C., 1964), p. 424.
23. ———, *Census of Population: 1960*, vol. 1, part 6 (Government Printing Office, Washington, D.C., 1963).
24. Department of Finance, State of California, population estimates prepared December 1971.
25. Bureau of the Census, *Census of Population: 1950*, vol. 2, part 1 (Government Printing Office, Washington, D.C., 1953), p. 182; *ibid.*, vol. 2, part 5 (1952), p. 212; *Census of Population: 1970*, PC(1)-D1 (1973), p. 640; *Current Population Reports* P-20, No. 255 (1973), p. 11; *ibid.*, P-20, No. 271 (1974), p. 13. United States data for 1973 and 1974 for age groups 15 to 19 and 15 to 44 were estimated from *Current Population Reports* data that referred to age groups 14 to 19 and 14 to 44. California data for 1973 and 1974 are estimates obtained by projecting the 1960 and 1970 census proportions.
26. ———, *Census of Population: 1970* PC(1)-D6 (Government Printing Office, Washington, D.C., 1972), p. 1298.
27. ———, *Census of Population: 1970* PC(1)-B6, California (Government Printing Office, Washington, D.C., 1971) pp. 88, 97; *Census of Population: 1960* PC(2)-1C (1963); p. 30.
28. Birth Records, Department of Health, State of California.
29. Legal Abortion Reports, Department of Health, State of California; see Table 3 for denominator sources. See (*2*) for methods used to estimate abortion rates for women residents of California. Estimates for 1973–1974 (the period affecting 1974 births) do not include abortions performed in doctors' private offices. Such abortions were legalized in California by the 1973 Supreme Court decision. Rates for 1971–1972 may differ slightly from those previously published.
30. Data were obtained by correspondence with state agencies. See also (*3*).
31. United States data from National Center for Health Statistics, *Trends in Illegitimacy*, Series 21, No. 15 (Government Printing Office, Washington, D.C., 1968), p. 25; *Monthly Vital Statistics Report*, various issues; various tables obtained through correspondence with the National Center for Health Statistics (NCHS); for sources of California data see Table 3. NCHS data on legitimate and illegitimate birth rate trends for the United States are based on estimation methods that differ in several respects from those we have used for California. Separated women are considered as unmarried in denominators for the California rates but are considered as married in those for the United States. Reasons for considering separated women as unmarried are discussed in B. Berkov and P. Shipley, *Illegitimate Births in California, 1966–1967* (Department of Public Health, State of California, Berkeley, 1971). Another difference between the California and U.S. data is in the methods used to estimate illegitimate births. The California birth certificate has no direct question about the legitimacy of the child or the marital status of the mother, but for statistical purposes the state has developed an inferential method. To estimate the number of illegitimate births in the country as a whole, the NCHS deals only with data from states that have a legitimacy item on the birth certificate; it extends the experience of these states to other states in the same region where the birth certificate asks no direct question about legitimacy. Since California, New York, and a number of other large states do not have such a question, their experience is not measured directly in the U.S. data. The omission of California and New York from the NCHS estimates is probably most serious for 1971 and later years, when births in these states, particularly illegitimate births, were strongly influenced by legal abortion. Because only the NCHS data show the trend in legitimate and illegitimate birth rates over a long time span, we have used the NCHS data for comparative purposes in Fig. 2.
32. The information in this article comes largely from a cooperative project of the California State Department of Health and the University of California, Berkeley. The project is headed by Kingsley Davis and partly supported by a contract with the National Institute of Child Health and Human Development, Center for Population Research (NIH-NOI-HD-32728). This article was made possible through the cooperation of the California Department of Health, in particular George C. Cunningham, Chief, Maternal and Child Health Unit, and Roger E. Smith, Acting Chief, Vital Statistics Section. The figures are by Hazel Anderholm of the Department of Health; research assistance was provided by Sarah Lee Tsai, Arlene Guerriero, and Harriet Heydemann, of International Population and Urban Research. We thank the National Center for Health Statistics and the state health departments for providing data.

**NEWS AND COMMENT**

# New Jersey Higher Education: Accountability Versus Autonomy

Rutgers started off as a colonial college in 1766, acquired a public facet to its essentially private character in the later 19th century when its science school became New Jersey's land-grant college, and then, after World War II, mutated into a full-fledged, multicampus state university.

As a private institution, Rutgers never attained the Ivy League gloss of its neighbor and old rival, Princeton, nor, as a state university, has it yet entered the heavyweight class with Berkeley and the Big Ten. But Rutgers earned a more-than-respectable academic reputation and, since New Jersey belatedly established a state system of higher education in 1966, Rutgers, the State University, as it is now formally titled, has appeared to have excellent long-term prospects for development.

Like most other states, however, New Jersey recently has had to put its budget through a wringer. Higher education has been caught in the squeeze, and the problem is compounded in New Jersey by a conflict between the legislature and a governor frustrated in his attempt to reform the state tax structure (*Science*, 22 August).

Rutgers, the senior institution in the state's public higher education system, has a history and habit of autonomy but, as part of the system, operates under the jurisdiction of the state higher education authority set up when the system was created in 1966. The growth of the New Jersey system has been rapid, and this has intensified competition within the system for resources and, particularly in the case of Rutgers, sharpened the contest over the limits of the state agency's decision-making powers. Tensions in state higher education systems are not unusual, but because New Jersey started so late, moved so fast, and, consequently, encountered financial trouble at such an inopportune time, the conflicts are more clearly defined, and, perhaps because of the personalities involved, seem to be more out in the open.

New Jersey's higher education authority consists of a Department of Higher Education (DHE), a chancellor, who runs DHE, and a Board of Higher Education, which advises the chancellor and is charged with the general supervision of higher education in the state. The 17-member board has nine citizen members appointed by the governor, six members who are representatives of educational institutions, including the chairman of the Rutgers board of governors, and two nonvoting, ex officio mem-