

# THIRD PROGRESS REPORT ON A STUDY OF FAMILY LIMITATION<sup>1</sup>

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## I

THERE have been published<sup>2</sup> two reports on the progress of a comprehensive investigation of human fertility and the factors that influence it, with particular reference to the practice of contraception. These earlier progress reports have dealt only with samples from the material, including respectively 2,000 and 4,945 women.

The purpose of the present paper is to report the general progress of the investigation towards final completion, up to the present date, and to set forth in tabular form and briefly discuss some fragments of the final results. Since the plan and method of the investigation have been fully described in the earlier reports cited it will not be necessary to repeat them here.

## II

Since the 1934 progress report was published we have *completed* (a) the *coding* of the information on all of the 30,949<sup>3</sup> reproductive life histories comprising the total material. This coding was done by the writer personally for each case history and all items of information, except for a few routine items for which the code numbers

<sup>1</sup> From the Department of Biology of the School of Hygiene and Public Health, The Johns Hopkins University. Presented at the Annual Meeting of the Milbank Memorial Fund, March 26-27, 1936.

<sup>2</sup> Pearl, R.: Preliminary Notes on a Cooperative Investigation of Family Limitation. Milbank Memorial Fund *Quarterly Bulletin*, January, 1933, xi, No. 1, pp. 37-60. Second Progress Report on a Study of Family Limitation. *Ibid.*, July, 1934, xii, No. 3, pp. 248-269.

The two reports cited were condensed abstracts of longer papers as follows: Pearl, R.: Contraception and Fertility in 2,000 Women. *Human Biology*, September, 1932, iv, No. 3, pp. 363-407; Contraception and Fertility in 4,945 Married Women. A second report on a study of family limitation. *Ibid.*, May, 1934, vi, No. 4, pp. 354-401.

The author wishes to acknowledge with deep gratitude the continued financial support the Milbank Memorial Fund has given to this work.

<sup>3</sup> Instead of 30,951 stated to be the total number in an earlier report. One case history turned out to have been included in duplicate. The other extra "case" was the result of an error in serial numbering, and did not exist in fact.

were put on the cards by Mrs. Augusta Hibbitts, but were subsequently checked by the writer personally. This coding was a tedious task. (b) The *computation* of the ages of the women and their consorts, and the age specific pregnancy and live birth rates, so that these data might be punched on the Hollerith cards; (c) the *punching* of two complete duplicate sets of just under 31,000 cards each, and the verification of the punching.

The *tabulation* of the complete material has been finished for a considerable number of items of information on the cards, and is steadily progressing at the present time relative to the remaining items.

The literature regarding fertility and the biology of human reproduction generally is extensive. Its digestion and assimilation is a formidable item in the program of the whole investigation. Steady progress is, however, being made. Already well over a thousand books, reports, and memoirs in medical, biological, sociological, and statistical journals pertinent to the enquiry have been read and abstracted in detail. The efficient help of Miss Hermine Grimm, assistant in biology, in this bibliographic phase of the work is gratefully acknowledged.

It is expected that the complete and definitive account of the results of the whole investigation will be published as a book, to be entitled HUMAN FERTILITY AND THE FACTORS THAT INFLUENCE IT. The present program calls for the completion of the manuscript by the end of the calendar year 1936. A substantial start on the writing has already been made. While experience has demonstrated the danger of prophecy relative to so extensive an undertaking as this, we are hopeful that the job will be finished within the scheduled time.

### III

The first object of the present report is to present some data that will enable the formation of judgments regarding the adequacy, relevancy, and representative character of the sample of

women whose reproductive life histories make up the material.

Table 1 shows the geographical distribution of the cases, by states, cities, and race (white or Negro). The material involves 30,949 women resident in or near twenty-six large cities in fifteen states, east of (or on) the Mississippi River, and north of the southernmost tier of states (Alabama, Mississippi, etc.). Eleven cities in four states (New York, Illinois, Ohio, and Missouri) furnished 16,900, or 54.6 per cent, of the cases. The others are scattered as indicated in the table.

Negroes are somewhat more frequently represented in the sam-

Table 1. Geographical distribution.

| STATES AND CITIES                                      | NUMBER OF COOPERATING HOSPITALS | TOTAL WHITE CASES | TOTAL NEGRO CASES | GRAND TOTAL All Cases |
|--|---------------------------------|-------------------|-------------------|-----------------------|
| TOTAL  | 139                             | 25,316            | 5,633             | 30,949                |
| New York (New York City, Rochester, Buffalo, Syracuse) | 31                              | 4,729             | 838               | 5,567                 |
| Illinois (Chicago)                                     | 20                              | 4,155             | 193               | 4,348                 |
| Ohio (Columbus, Cleveland, Cincinnati, Toledo, Akron)  | 16                              | 3,212             | 861               | 4,073                 |
| Missouri (St. Louis)                                   | 7                               | 2,017             | 895               | 2,912                 |
| Minnesota (Minneapolis, St. Paul)                      | 12                              | 2,729             | 44                | 2,773                 |
| Michigan (Detroit, Ann Arbor)                          | 10                              | 2,161             | 393               | 2,554                 |
| Pennsylvania (Philadelphia and suburbs, Pittsburgh)    | 16                              | 1,901             | 619               | 2,520                 |
| Maryland (Baltimore)                                   | 9                               | 1,654             | 684               | 2,338                 |
| Tennessee (Nashville, Memphis)                         | 6                               | 567               | 738               | 1,305                 |
| Indiana (Indianapolis)                                 | 3                               | 738               | 46                | 784                   |
| Kentucky (Louisville)                                  | 3                               | 429               | 305               | 734                   |
| Wisconsin (Milwaukee)                                  | 3                               | 643               | 1                 | 644                   |
| Massachusetts (Boston)                                 | 1                               | 248               | 9                 | 257                   |
| District of Columbia (Washington)                      | 1                               | 120               | —                 | 120                   |
| New Jersey (Jersey City)                               | 1                               | 13                | 7                 | 20                    |

|  | <i>White</i> | <i>Negro</i> |
|--|--------------|--------------|
| Percentage of women in present sample                                    | 81.8         | 18.2         |
| Percentage of living births in the fifteen states in 1931 and 1932       | 94.5         | 5.3          |
| Percentage of living births in Birth Registration Area, in 1931 and 1932 | 87.3         | 11.3         |

| PERCENTAGE OF ILLEGITIMATE<br>BIRTHS TO ALL BIRTHS IN                                    | WHITES | NEGROES<br>(OR COLORED) |
|--|--------|-------------------------|
| Present material   | 2.6    | 13.8                    |
| States from which present sample was drawn (excluding<br>Massachusetts) in 1931 and 1932 | 2.0    | 12.9                    |
| U. S. Birth Registration Area, 1931 and 1932   | 2.0    | 15.3                    |

Table 2. Illegitimacy.

ple than in the general population of the states from which it was drawn, or than in the United States as a whole. This, however, is rather an advantage than otherwise, because even 5,633 Negro cases are not enough, as will presently appear, to furnish adequate data when we come to finer categorical divisions relative to contraception, etc.

The fifteen states from which the present data are drawn include in their population (in 1930) 61.7 per cent of all white women in the United States 15 years of age and over, and 30.4 per cent of all Negro women in the country in the same age category. It is therefore probable that if the present sample fairly represents the population from which it was drawn it will also be fairly representative of the population of the United States as a whole, particularly so far as concerns white women.

Table 2 shows that the present sample agrees rather closely with the general population of the states from which it was drawn (excluding Massachusetts which keeps no records of illegitimacy), and with the general population of the United States as a whole, in respect of percentage of *illegitimacy*. On purely *a priori* grounds it might have been thought that the percentage of illegitimacy shown in a sample of urban-dwelling women resorting to hospitals to have their babies would be considerably higher than in the general population, but the data plainly give no significant support to such a view. In short the present sample appears to be fairly representative of the general population in this respect.

Similarly it is evident from Table 3 that in respect of *nativity* of

| PERCENTAGES IN                            | NATIVE BORN | FOREIGN BORN |
|---|-------------|--------------|
| Present material                          | 86.4        | 13.6         |
| States from which present sample was born |             |              |
| Mothers of living births, 1931 and 1932   | 85.1        | 14.8         |
| U. S. Birth Registration Area             |             |              |
| Mothers of living births, 1931 and 1932   | 88.6        | 11.3         |

Table 3. Nativity of white women.

white women, the present sample is very fairly representative of the general population not only of the states from which it was drawn, but also of the United States as a whole.

Table 4 deals with the *religion* of the women in the present sample. In Part A of the table the material is thrown into five broad religious groups. In this classification "Christians" includes the women who expressed no denominational affiliation or preference, but wished it to be understood that they were neither Jews nor atheists.

The groups at the head of Part A of Table 4 have the following meanings:

INWED includes those women who experienced all their pregnancies while they were living in the state of wedlock.

OUTWED includes those women who experienced all their pregnancies while living outside the state of wedlock. This class includes two subclasses. Of these the first (ILLEG) includes those women who had never married up to the time of record. The second (PRENUP) includes those women who had conceived outside of wedlock, but who had subsequently married before the time of record and before the delivery of the products of their conceptions (prenuptial conception).

PARTLY includes those women some of whose conceptions and pregnancies had occurred while they were living in a state of wedlock, while others occurred while they were living outside the state of wedlock.

These four classes together include all the women in the sample.

## Part A

| RE-<br>LIGION | WHITES |        |         |       |        |                | NEGROES           |                |        |         |       |        | TOTAL |                |                   |               |
|---------------|--------|--------|---------|-------|--------|----------------|-------------------|----------------|--------|---------|-------|--------|-------|----------------|-------------------|---------------|
|               | Inwed  | Outwed |         |       | Partly | Total<br>White | Per Cent<br>White | Inwed          | Outwed |         |       | Partly |       | Total<br>Negro | Per Cent<br>Negro | Both<br>Races |
|               |        | Illeg. | Prenup. | Total |        |                |                   |                | Illeg. | Prenup. | Total |        |       |                |                   |               |
| TOTAL         | 22,965 | 667    | 836     | 1,503 | 848    | 25,316         | 100.0             | 3,571          | 777    | 458     | 1,235 | 827    | 5,633 | 100.05         | 30,949            |               |
| Protestants   | 10,703 | 379    | 436     | 815   | 442    | 11,960         | 47.2              | 3,291          | 706    | 420     | 1,126 | 779    | 5,196 | 92.2           | 17,156            |               |
| Catholics     | 8,842  | 245    | 368     | 613   | 360    | 9,815          | 38.8              | 233            | 49     | 28      | 77    | 33     | 343   | 6.1            | 10,158            |               |
| Jews          | 2,805  | 18     | 15      | 33    | 27     | 2,865          | 11.3              | 1 <sup>1</sup> | —      | —       | —     | —      | 1     | .05            | 2,866             |               |
| Christians    | 402    | 12     | 11      | 23    | 10     | 435            | 1.7               | 15             | 2      | 2       | 4     | 3      | 22    | .4             | 457               |               |
| No religion   | 213    | 13     | 6       | 19    | 9      | 241            | 1.0               | 31             | 20     | 8       | 28    | 12     | 71    | 1.3            | 312               |               |

## Part B

| DENOMINATIONAL GROUPS      | PERCENTAGE OF WOMEN<br>(BOTH RACES)<br>IN PRESENT MATERIAL | PERCENTAGE OF MEMBERS<br>OF DENOMINATION IN THE<br>UNITED STATES IN 1926 |
|----------------------------|--|--|
| SIX DENOMINATIONS TOGETHER | 79.2   | 79.5   |
| Catholic                   | 32.8   | 34.1   |
| Baptist                    | 14.7   | 14.7   |
| Methodist                  | 11.4   | 13.9   |
| Jewish                     | 9.3  | 7.5  |
| Lutheran                   | 7.9  | 5.0  |
| Presbyterian               | 3.1  | 4.3  |

<sup>1</sup> West Indian mulatto, whose white ancestry was Jewish, and in that faith she worships.

Table 4. Religion.

Confining attention for the moment primarily to Part A of Table 4 it is seen that while among the whites just under a half are Protestants, the Catholics are a rather close second in total representation. Actually, as Part B shows, there were more than twice as many Catholic women proportionately in the sample as there were of any other *single* denomination. The Protestants overtop the Catholics in the total because of the cumulative effect of their numerous separate denominations or sects. Among the Negroes, the Protestants overwhelmingly predominate.

A point of particular interest in Part A of Table 4 is the ex-

tremely low proportion of Jews, as compared with other religious categories, found in the OUTWED and PARTLY classes. The figures speak well for the extent to which the standards of sexual morality in the Jewish code are lived up to, even in present day urban populations.

Turning attention now to Part B of Table 4 it is evident that the present sample is very fairly representative of the general population of the United States as a whole in respect of affiliation with the six principal separate denominations, which together include just under 80 per cent of all persons having any religious affiliations at all. The greatest departure of the present sample from the general population is for the Lutherans, probably connected with the fact that we are dealing only with residents of large urban centers. But, taken as a whole, Part B of Table 4 shows clearly that there is no reason to mistrust the present sample on grounds of religious distribution.

Table 5 deals with the formal *education* of the women in the sample. Part A shows that about 40 per cent of the white women, and about 30 per cent of the Negro women, received high school or higher educational training. Unfortunately no statistics are known to the writer that would make it possible to determine whether these proportions are fairly representative of conditions in the general population or not. It appears probable from general considerations that the sample is not widely divergent in this respect, but there seems no way available to test the point adequately for the whole educational range.

In respect of one educational category (the illiterate), however, there are general population statistics for comparison. This comparison is made in Part C of Table 5. The first two lines of that tabulation indicate that, insofar as illiteracy may be used as a criterion, the present sample is fairly close to the general population of the states from which it was drawn. On the basis of this criterion the present sample, insofar as it diverges at all, is better (that is,



*Part A*

| HIGHEST DEGREE OF FORMAL EDUCATION | TOTAL WHITE | PER CENT WHITE | TOTAL NEGRO | PER CENT NEGRO | GRAND TOTAL |
|------------------------------------|-------------|----------------|-------------|----------------|-------------|
| TOTAL                              | 25,316      | 100.0          | 5,633       | 100.0          | 30,949      |
| Illiterate                         | 526         | 2.1            | 294         | 5.2            | 820         |
| Elementary schools                 | 14,605      | 57.7           | 3,657       | 64.9           | 18,262      |
| High school                        | 8,513       | 33.6           | 1,575       | 28.0           | 10,088      |
| College or university              | 1,672       | 6.6            | 107         | 1.9            | 1,779       |

*Part B*

*Percentages of "Illeg," "Prenup" and "Partly" Classes, by Extent of Formal Education*

| HIGHEST DEGREE OF FORMAL EDUCATION | ILLEG |       | PRENUP |       | PARTLY |       | TOTAL OF THREE CLASSES |       |
|------------------------------------|-------|-------|--------|-------|--------|-------|------------------------|-------|
|                                    | White | Negro | White  | Negro | White  | Negro | White                  | Negro |
| Illiterate                         | 3.6   | 14.3  | 0.8    | 1.7   | 5.7    | 28.6  | 9.5                    | 44.6  |
| Elementary schools                 | 2.8   | 14.5  | 3.6    | 7.2   | 4.2    | 15.7  | 10.6                   | 37.4  |
| High school                        | 2.5   | 12.7  | 3.5    | 11.5  | 2.2    | 10.4  | 8.2                    | 34.6  |
| College or university              | 1.7   | 5.6   | 1.0    | 7.5   | 0.9    | 4.7   | 3.6                    | 17.8  |

*Part C*

*Illiteracy Percentages*

| ILLITERACY PERCENTAGE IN   | WHITES | NEGROES | BOTH RACES |
|--|--------|---------|------------|
| Present sample   | 2.1    | 5.2     | 2.5        |
| Females in states from which present sample was drawn, 1930 (Ages 15 and over) | 3.3    | 7.4     | 3.5        |
| Females in U. S. A., 1930 (Ages 15 and over)                                   | 3.1    | 16.7    | 4.4        |

Table 5. Education.

indicates more educational training) than the general population from which it came. This would seem to be not only a harmless divergence, but indeed a satisfactory one rather than otherwise, considering the basic objectives of the present investigation as a whole. The percentage of illiteracy among the Negroes in the present sample is less than a third of that in the general population of the country as a whole. But this is reasonably to be expected since we are dealing only with urban and nearby suburban dwellers. Negro illiteracy is much higher generally in the rural South than in large cities located farther north.



Part B of Table 5 brings out the interesting fact that (with a curious and so far unexplained discrepancy in respect of illiterate white and Negro PRENUP) the overt consequences of loose sexual morality diminish with increasing extent of formal education. It would be rash in the extreme to conclude from the figures that adherence to a high code of sexual morality increases with extent of formal education, because in fact the data give no warrant for such a conclusion. Just possibly the precise opposite may be the case. All that the figures in Part B definitely demonstrate is that, in this sample, the overt consequences of sexual immorality expressed in pregnancy are less frequent proportionally (with the discrepancy noted above excepted and reserved) the higher the extent of formal education, in both whites and Negroes. A crude but reasonable way of putting the matter is that while more highly educated girls may or may not be more moral than their educationally less fortunate sisters, at least they know better, on the average, how to forefend the dire consequences of such excursions as they may choose to make into the realm of amatory dalliance.

In concluding this section of this progress report it may be of interest, and proper, to say that in all other respects where it has so far been possible to examine carefully and critically into the question of the representative character and adequacy of the sample the results have been generally of the same sort as those presented here. That is, the results have indicated that the sample is justly representative of the general population from which it was drawn. Naturally in the final report this matter will be gone into in much further detail. But up to this time each day's further critical analysis of the whole body of data has increased confidence in their validity and fundamental soundness.

## IV

We turn now to brief consideration of some fragments of the definitive *results* relative to the main objectives of the inquiry.

Table 6 presents condensed figures as to the frequency of the

## Part A. Whites

| PRACTICE OF CONTRACEPTION                   | INWED   |          | OUTWED  |          | PARTLY  |          | TOTALS  |          |
|---|---------|----------|---------|----------|---------|----------|---------|----------|
|   | Num-ber | Per Cent | Num-ber | Per Cent | Num-ber | Per Cent | Num-ber | Per Cent |
| TOTAL                                       | 22,965  | 99.93    | 1,503   | 100.0    | 848     | 100.1    | 25,316  | 99.92    |
| No contraception                            | 11,849  | 51.6     | 1,322   | 88.0     | 511     | 60.3     | 13,682  | 54.0     |
| Contraception attempted in some form        | 10,318  | 44.9     | 177     | 11.8     | 311     | 36.7     | 10,806  | 42.7     |
| No contraception stated, but record doubted | 792     | 3.4      | 4       | .2       | 26      | 3.1      | 822     | 3.2      |
| No information                              | 6       | .03      | —       | —        | —       | —        | 6       | .02      |

## Part B. Negroes

| PRACTICE OF CONTRACEPTION                   | INWED   |          | OUTWED  |          | PARTLY  |          | TOTALS  |          |
|---|---------|----------|---------|----------|---------|----------|---------|----------|
|   | Num-ber | Per Cent | Num-ber | Per Cent | Num-ber | Per Cent | Num-ber | Per Cent |
| TOTAL                                       | 3,571   | 100.0    | 1,235   | 100.0    | 827     | 100.0    | 5,633   | 100.0    |
| No contraception                            | 2,828   | 79.2     | 1,152   | 93.3     | 696     | 84.2     | 4,676   | 83.0     |
| Contraception attempted in some form        | 717     | 20.1     | 82      | 6.6      | 126     | 15.2     | 925     | 16.4     |
| No contraception stated, but record doubted | 26      | .7       | 1       | .1       | 5       | .6       | 32      | .6       |
| No information                              | —       | —        | —       | —        | —       | —        | —       | —        |

Table 6. Contraception.

*practice of contraception.* Considering first the totals for the whites it is seen that 42.7 per cent of the women had practised contraception before the time of record, regularly or intermittently, intelligently or stupidly, as the case may have been. Fifty-four per cent of the women stated that, to the time of record, they had never practised contraception. The medical cooperators who took and recorded their reproductive life histories for this investigation found no reason in their demeanor, behavior, or histories to doubt their statements. Nor did the writer, who went carefully and critically over every detail of each individual history with this particular point in mind, find any internal evidence in the history itself to justify doubt as to its truthfulness on this point.

In addition to this 54 per cent of the white women 822, or 3.2 per cent, also stated that they had never practised contraception, but either the medical cooperators or the writer, or both, found reason to doubt their statements on the point. If a woman's record showed too long gaps between pregnancies, unexplained in the history by illness or otherwise, and she affirmed that she had not practised contraception, her record was forthwith thrown into the doubtful category. Doubtless this was unjust to many women—they probably were in fact telling the truth—but the adoption of the procedure followed had the effect of measurably increasing confidence in the residual 54 per cent accepted as not practising contraception. Later in this paper statistical evidence will be presented that indicates that the pregnancy rates shown by these women objectively justify in high degree this confidence. In passing it may be of some interest to note that, of the 822 white women whose statements that they had never practised contraception were doubted, 44.6 per cent were Catholics.

For six white women out of the total of 25,316 it was impossible to get any clear information as to whether contraception was practised or not. This was chiefly because of their low level of mentality.

Among the Negro women only 16.4 per cent in total had practised contraception. As for the remainder, 83 per cent of the total stated that they had never done so, and no reason was found by anybody to doubt their statement. This left thirty-two women, or 0.6 per cent, whose statements that they had not practised contraception were doubted for one reason or another.

As would be expected the proportion of women practising contraception in both racial groups is much higher in the INWED class than in either the OUTWED or PARTLY. Obviously one important reason why most of the women who found themselves in these latter two unenviable classes did so was that they had failed to control conception.

There are two classes of women that do not appear in the present sample by reason of the way in which it was collected. These are:

(a) Women who were themselves permanently sterile physiologically or belonged to matings that were permanently sterile.

(b) Women who on all other grounds might have been included, but who did not become pregnant between about October, 1930, and April, 1932. Presumably some portion of these women did not become pregnant because they were effectively practising contraception during this period. Of such women two categories may be distinguished; namely (1) those who desiring a family, but a small one, did not time a pregnancy to fall into the period covered by this study, and (2) those who desired never to have any children at any time, and successfully and effectively practised contraception to the realization of that end.

It is reasonable to suppose that if there were a just representation of women of category (a) in the sample it would tend to raise by a small amount the total percentage in Table 6 of those not practising contraception, on the ground that sterile women and women in sterile matings seem in actual experience to discover their sterility fairly soon after marriage and stop attempts at contraception.

Of the women in category (b) those in the two subclasses are on a somewhat different footing statistically. Those in subclass (1) may probably safely be completely disregarded so far as concerns any potential effect they might be supposed to have upon the percentages of Table 6. The reason for this opinion is found in the great statistical stability of official birth statistics from year to year relative to age and other characteristics of the mothers involved. For the most part the women who appear as mothers in the birth statistics of calendar year  $n + 1$  are individually different women from those who appear as mothers in the statistics of the year  $n$ . Yet the relative age distributions of mothers of the years  $n$  and  $n + 1$  are almost precisely identical. By parity of reasoning it appears probable that the proportion of women practising contra-

ception among mothers of one year will not be greatly different from the proportion among mothers of the previous year, except insofar as it may be increased by women beginning for the first time in their lives the practice of contraception—that is leaving the “no contraception” cohort to which they had always previously belonged and passing over into the “contraception” cohort. The proportion of such new recruits in the total at any given moment is probably not large, but this proportion is probably increasing more rapidly per unit of time under present conditions than it has in the last fifty years, and doubtless will continue to increase.

But if we consider not the percentages of Table 6, which are by definition percentages of *mothers*, and consider inferentially the percentages of *women* in the whole population exposed to risk of pregnancy (*i.e.*, indulging in sexual intercourse) it is reasonable to suppose that the percentage of them practising contraception will be somewhat, but probably not greatly, higher than that of Table 6, because of the existence of the subcategory (b) (1).

Finally it is reasonable to suppose that there may be some women really falling in the subcategory (b) (2), that is, women not physiologically sterile but actually never pregnant because of their unfailingly effective practice of contraception from first coitus to menopause. But all the evidence available appears to indicate that the percentage of such women in the general population must be small. It would doubtless be somewhat larger if absence of live births were taken as the criterion of a sterile mating (as in Notestein's analysis of census data) than if the criterion were taken to be absence of any product of conception. Thus it would be statistically tempting, but probably biologically dubious, to charge all the increase in sterility percentages between 1890 and 1910 found by Notestein<sup>4</sup> to the practice of contraception by women in the subcategory under discussion.

<sup>4</sup> Notestein, F. W.: The Decrease in Size of Families from 1890 to 1910. *Milbank Memorial Fund Quarterly Bulletin*, October, 1931, ix, No. 4, pp. 181-188.

To summarize the necessarily brief discussion of the matter that can be undertaken here it seems probable that the percentage of white women definitely recorded in Table 6 as practising contraception somewhat underestimates the corresponding percentage for the general population from which the sample was drawn, but not greatly so. Considering the fact that the figures of Table 6 include all ages; all durations of marriage; the whole range of variation in number of pregnancies experienced; and all sorts of social, economic and educational levels, it would seem hazardous to estimate the percentage of white contraceptors among the women in the general population of the fifteen states dealt with at more than 55 to 60 per cent (that is,  $42.7 + 3.2 +$  about 10 to 15).

This estimate will be objected to by some as too low. It will be pointed out that women coming to birth control clinics for the first time show a much higher percentage than those reporting here to have previously attempted contraception.<sup>5</sup> But women attending upon birth control clinics are known to be a highly selected and differentiated group. It has been shown by the writer<sup>6</sup> that they are a much more fertile group than the generality of women. Furthermore as a group they are heavily overweighted with multipara,<sup>7</sup> and the present material shows unequivocally an increase in contraceptive practices with increasing number of pregnancies experienced. Relatively few women, aside from those in the uppermost social and economic strata, begin contraception in the first years of conjugal life.

An interesting additional sidelight is thrown upon this discussion by the following figures. Considering only white women mar-

<sup>5</sup> Cf. Robishaw, R. A.: A Study of 4,000 Patients Admitted for Contraceptive Advice and Treatment (*American Journal of Gynecology and Obstetrics*, 1936, 31, pp. 426-434), where the percentage is put as "at least 85."

<sup>6</sup> Pearl, R.: Statistical Report on the Fourth Year's Operations of the Bureau for Contraceptive Advice. *Fourth Report*, Bureau for Contraceptive Advice, Baltimore, pp. 3-15, 1932.

<sup>7</sup> Seventy-eight per cent of Robishaw's (*loc. cit.*) 4,000 cases had been pregnant two or more times at admittance. The experience of the Bureau for Contraceptive Advice in Baltimore (Pearl, *loc. cit.*) showed 92 per cent of this status.



ried once only and free of gynecological disease, the data show that, among the total number of women exposed to risk of becoming pregnant in each age period, the following percentages *had practised contraception*, in some form or other.

| <i>Age Period</i> | <i>Per Cent Who Had Attempted Contraception</i> |
|-------------------|---|
| 10-14             | 33.2  |
| 15-19             | 43.3  |
| 20-24             | 53.1  |
| 25-29             | 57.2  |
| 30-34             | 55.2  |
| 35-39             | 49.9  |
| 40 and over       | 39.7  |

It will be seen that these figures tend to confirm the writer's estimate stated above of 55 to 60 per cent as a maximum for the general population from which the present sample was drawn.

After prolonged study of the matter and examination of all the available evidence the writer has come to the conclusion that the proportion of married women in the general population practising contraception is a statistic that cannot be precisely determined or proved. The best that can be hoped for is a judgment that shall take into account as justly as may be all the evidence direct and indirect. The writer's present judgment on the point has been stated above. It is not to be regarded as dogmatic or final, but on the contrary is subject to revision whenever any new sort of evidence appears that warrants a change. It merely represents the best present judgment of one student of the problem.

One final word as to the Negro women: There seems to be no reason to doubt that the percentages of Part B of Table 6 represent with substantial accuracy the relative frequency of contraceptive practices in the particular general population from which the present sample was drawn. They indicate that roughly only about a third as many Negro as white women resort to contraception. It seems probable that there will be little serious disagreement with



## Part A. Means

| AGE PERIOD<br>OF EXPOSURE<br>TO RISK OF<br>PREGNANCY | WHITES |           | NEGROES |            | DIFFERENCE | DIFF.<br>P. E. DIFF. |
|--|--------|-----------|---------|------------|------------|----------------------|
|  | N      | Mean      | N       | Mean       |            |                      |
| 10-14  | 203    | 4.19±.57  | 147     | 7.03±.98   | +2.84±1.09 | 2.6                  |
| 15-19  | 5,080  | 16.87±.21 | 1,688   | 16.05±.36  | -.82±.42   | 2.0                  |
| 20-24  | 6,605  | 15.56±.16 | 1,608   | 14.00±.30  | -1.56±.34  | 4.6                  |
| 25-29  | 4,132  | 12.55±.17 | 883     | 10.70±.28  | -1.85±.33  | 5.6                  |
| 30-34  | 2,092  | 10.32±.20 | 378     | 10.98±.44  | +.66±.48   | 1.4                  |
| 35-39  | 909    | 11.64±.33 | 122     | 12.21±.77  | +.57±.83   | 0.7                  |
| 40 and over  | 226    | 14.63±.81 | 27      | 11.80±1.71 | -2.83±1.89 | 1.5                  |

## Part B. Medians

| AGE PERIOD<br>OF EXPOSURE<br>TO RISK OF<br>PREGNANCY | WHITES |           | NEGROES |           | DIFFERENCE | DIFF.<br>P. E. DIFF. |
|--|--------|-----------|---------|-----------|------------|----------------------|
|  | N      | Median    | N       | Median    |            |                      |
| 10-14  | 203    | 0.60±.71  | 147     | 0.69±1.23 | +0.09±1.42 | 0.06                 |
| 15-19  | 5,080  | 8.14±.26  | 1,688   | 7.97±.45  | -.17±.52   | 0.33                 |
| 20-24  | 6,605  | 8.34±.20  | 1,608   | 8.37±.38  | +0.3±.43   | 0.07                 |
| 25-29  | 4,132  | 7.16±.21  | 883     | 7.25±.35  | +.09±.41   | 0.22                 |
| 30-34  | 2,092  | 6.19±.25  | 378     | 6.89±.55  | +.70±.60   | 1.17                 |
| 35-39  | 909    | 6.84±.41  | 122     | 8.44±.97  | +1.60±1.05 | 1.52                 |
| 40 and over  | 226    | 7.27±1.01 | 27      | 6.50±2.14 | -.77±2.36  | 0.33                 |

Table 7. Pregnancy rates per 100 computed ovulations in women not practising contraception, married once only, and without any gynecological disease.

this figure on the part of those acquainted with the sex attitudes and *mores* of the American Negro.

Table 7 presents the mean and median pregnancy rates<sup>8</sup> (pregnancies per 100 computed ovulations) in quinquennial age periods of exposure to risk of pregnancy, for all the women in the sample who (a) had never practised contraception; (b) had been married once only; and (c) had no form of gynecological disease. The object of this table is to set forth as accurately as the data permit what may be regarded as the *normal fertility* of a sample of American women pregnant in 1930-1932.

The data of Table 7 are shown graphically in Figures 1 and 2.

<sup>8</sup> For a description of the reasoning on which these rates are based, and the method of computing them see the writer's second progress report cited in footnote 2.

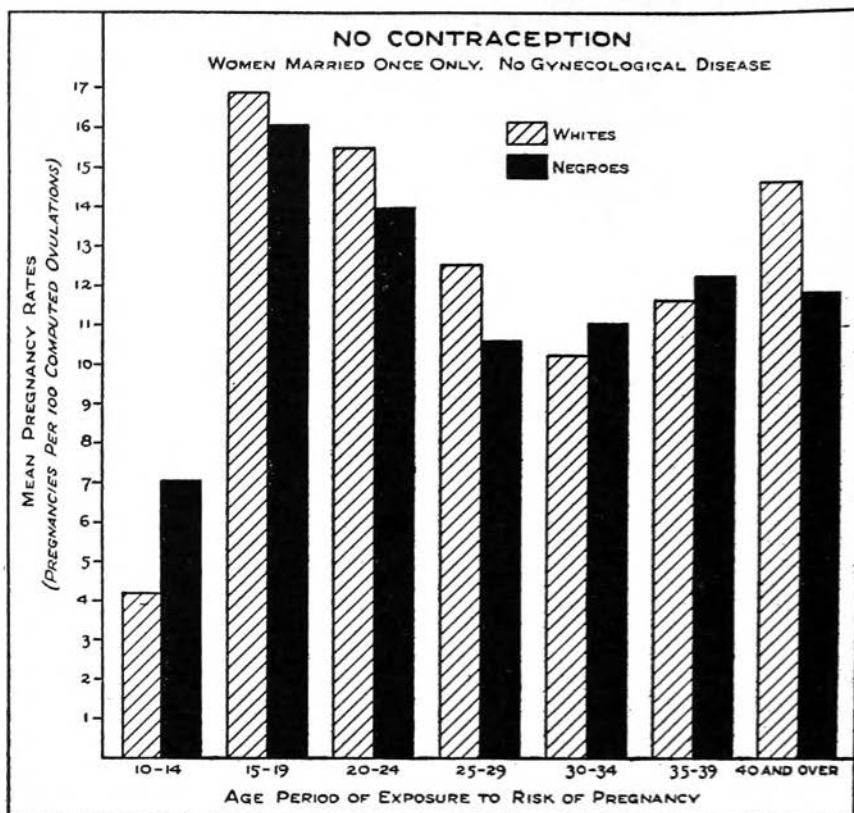


Fig. 1. Mean pregnancy rates for white and Negro women not practising contraception, married once only, and free of gynecological disease.

The first point that is evident from the figures of Table 7 (and also those of the following Tables 8 and 9) is that the pregnancy rate frequency distributions at all age periods are extremely skew, having a heavy piling up of frequency at the lowest rates, and then stretching out over a long range of higher rates with low frequencies. On account of this extreme skewness of the distributions the median is the centering constant of choice. It is more stable and more truly representative of the general situation.

On account of the limitations of time available it will be possible to discuss but two of the main results that emerge from the data of Table 7. The first of these relates to the form of the curves of means and medians relative to age periods of exposure. The classical form

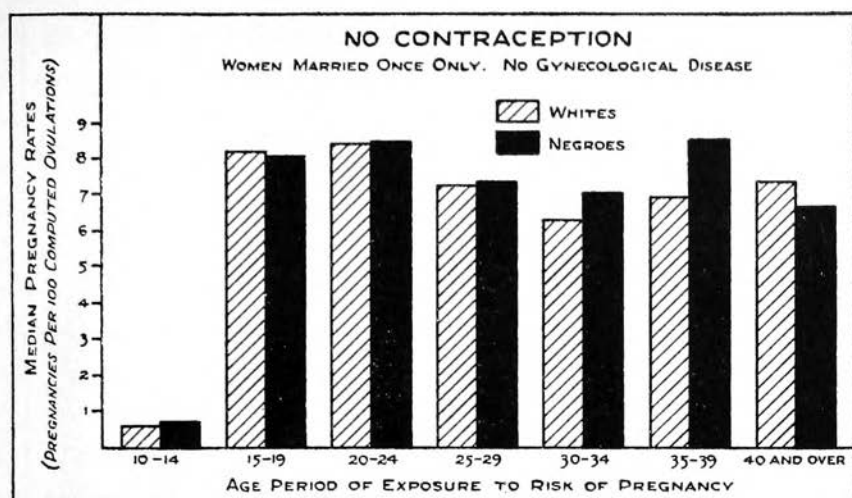


Fig. 2. Like Fig. 1 but for median pregnancy rates.

of age fertility curve is that of Tait, predicated upon the data of Matthews Duncan, and in its broad features confirmed by Körösi and many later workers. It runs, as Tait originally stated it, for a total fertility (family size) of 12, as follows:

| <i>Age</i> | <i>Fertility</i> |
|------------|------------------|
| 15-20      | 12               |
| 20-25      | 8.9              |
| 25-30      | 6.0              |
| 30-35      | 3.7              |
| 35-40      | 2.0              |
| 40-45      | 0.6              |
| 45-50      | 0.1              |

The means or medians of Table 7 are not like this at all. They rise from a low point in the age period 10-14 to a high level at 15-19. That high level is maintained in the 20-24 period. Thereafter it slowly declines to the 35-39 period where it again rises, and in the 40 and over period it reaches practically the initial high level of early life.

What is the reason for this wide discrepancy from the results of such sound workers as Matthews Duncan and Körösi? The answer

is found chiefly in the fact that the data were collected in different ways and represent different things, in two important respects. In the first place in the present data the same individual women contribute to the determination of the value of the mean rates in each and every age period falling within the durations of their respective marriages. In short the whole reproductive life of each woman is followed throughout the whole course of its unfolding up to the date of record. Duncan's and other later standard age fertility curves, on the other hand, are determined, in principle, by the examination of the ages of mothers of births in a single year. In consequence each individual woman appears but once, and in a particular age period. In the second place, owing to the method in which the present data were collected it results that the only women represented *in the final 40 and over age period* were women who were pregnant at least once in that period. Women exposed to risk of pregnancy in that period who did not become pregnant in the period simply are not represented at all. The same is true in some degree, but a progressively lessening one, in each of the earlier age periods.

The rates upon which Table 7 is based are basically rates of the type

$$(A) = \frac{\text{Number of pregnancies in an age period}}{\text{Total women-years exposure to risk of pregnancy in the same age period of women who actually became pregnant in that or some later period}}$$

whereas the usual expression of a fertility rate is of the type

$$(B) = \frac{\text{Number of births in an age period}}{\text{Total number of women potentially capable, because married, of becoming mothers in the same period}}$$

Obviously these are quite different kinds of rates, and will lead to quite different numerical results. But while rates of type (A)

cannot be directly compared with those of type (B), any two rates of type (A) may as justly be *compared with each other* as may any two rates of type (B) be compared with each other.

In simplest terms, one statistical situation connected with the fact that in the present material each woman's reproductive history is continuously followed to the date of record may be put this way: As a matter of observation only a small percentage of all married women upwards of 40 years of age ever become pregnant, but a high percentage of all such women (*i.e.*, those who become pregnant at that age) have been extremely fertile throughout their lives. In lesser degree, but still to a marked degree, the same two things are true about women in the 35-39 age group and so on back, *mutatis mutandis*. The consequences of these relations in determining mean and median pregnancy rates as in Table 7 are evident without further discussion.

In the final detailed treatment of the present data certain other fertility rates will be discussed that will bring out in detail the relationship of the present type of fertility data to the conventional type derived from age specific natality data from general populations. Limitations of time and space forbid going further into such discussions here.

The second main result of Table 7 that can be discussed here is the close agreement between the mean and median fertility rates of whites and Negroes, in the absence of contraception. This result was tentatively set forth in the second progress report. It is now abundantly confirmed by the whole material. In the case of the means, the Negro rates are lower than the white in four age periods, and higher in three. Furthermore in the only two age periods where the differences can be regarded as significant in comparison with their probable errors, the Negro mean is lower than the white. In the medians, that are as has already been noted the more reliable centering constants in this case, no difference at any age period even approaches statistical significance.

## Part A. Means

| AGE PERIOD<br>OF EXPOSURE<br>TO RISK OF<br>PREGNANCY | WHITES |            | NEGROES |            | DIFFERENCE | DIFF.<br>P. E. DIFF. |
|--|--------|------------|---------|------------|------------|----------------------|
|  | N      | Mean       | N       | Mean       |            |                      |
| 10-14  | 39     | 2.71±.72   | 14      | 4.18±1.12  | +1.47±1.33 | 1.1                  |
| 15-19  | 1,526  | 9.22±.26   | 167     | 12.70±.86  | +3.48±.90  | 3.9                  |
| 20-24  | 2,620  | 10.35±.18  | 193     | 13.30±.93  | +2.95±.95  | 3.1                  |
| 25-29  | 1,660  | 9.47±.21   | 104     | 11.30±.90  | +1.83±.92  | 2.0                  |
| 30-34  | 746    | 8.99±.32   | 45      | 10.18±1.02 | +1.19±1.07 | 1.1                  |
| 35-39  | 280    | 8.97±.47   | 16      | 12.22±1.65 | +3.25±1.72 | 1.9                  |
| 40 and over  | 51     | 15.75±2.02 | 2       | —          | —          | —                    |

## Part B. Medians

| AGE PERIOD<br>OF EXPOSURE<br>TO RISK OF<br>PREGNANCY | WHITES |           | NEGROES |           | DIFFERENCE | DIFF.<br>P. E. DIFF. |
|--|--------|-----------|---------|-----------|------------|----------------------|
|  | N      | Median    | N       | Median    |            |                      |
| 10-14  | 39     | 0.59±.90  | 14      | 0.70±1.41 | +0.11±1.66 | 0.07                 |
| 15-19  | 1,526  | 4.71±.33  | 167     | 7.19±1.08 | +2.48±1.13 | 2.2                  |
| 20-24  | 2,620  | 5.98±.23  | 193     | 8.15±1.16 | +2.17±1.18 | 1.8                  |
| 25-29  | 1,660  | 5.34±.26  | 104     | 7.00±1.13 | +1.66±1.16 | 1.4                  |
| 30-34  | 746    | 4.87±.40  | 45      | 6.50±1.28 | +1.63±1.34 | 1.2                  |
| 35-39  | 280    | 4.84±.59  | 16      | 9.00±2.07 | +4.16±2.15 | 1.9                  |
| 40 and over  | 51     | 9.10±2.53 | 2       | —         | —          | —                    |

Table 8. Pregnancy rates per 100 computed ovulations in women practising some form of contraception regularly and steadily without intermission. Women married once only, and without any gynecological disease.

There are two pertinent consequences of this result. In the first place it contributes an interesting and significant anthropological and sociological datum. In the second place, it strongly supports the view that substantially all of the 54 per cent of white women who said they had never practised contraception up to the time of record were not lying.

For comparison with Table 7 two further tables are presented dealing with women who practised contraception in different ways. Table 8 gives mean and median pregnancy rates for women (a) who not wanting children up to the time of record practised contraception regularly and steadily throughout their married lives to the best of their, on the record, somewhat feeble abilities,

never intermitting it intentionally for any reason whatsoever; (b) who had been married once only; and (c) who were free of any gynecological disease.

If the means and medians of Table 8 are compared, age period by age period, with those of Table 7 it will be seen that the practice of contraception in the manner described resulted generally in lower pregnancy rates among the whites than those experienced by women not practising contraception at all. Among the Negro women the resulting differences in pregnancy rates are extremely slight, and wholly insignificant either statistically or biologically.

Among the white women, the median pregnancy rates achieved with the dogged, unintermitted, but obviously stupid practice of contraception bore the following percentage relations to those exhibited by the women of Table 7 not practising contraception at all.

| <i>Age Period</i> | <i>Percentage</i> |
|-------------------|-------------------|
| 10-14             | 98.3              |
| 15-19             | 57.9              |
| 20-24             | 71.7              |
| 25-29             | 74.6              |
| 30-34             | 78.7              |
| 35-39             | 70.8              |
| 40 and over       | 125.2             |

In general terms it is evident that the diligent contraception of these women, except in the 15-19 age period, yielded only a meager 20 to 30 per cent dividend in the way of surcease from the troublesome consequences of coition instead of the intended 100 per cent.

It is interesting to note that the differences between whites and Negroes in Table 8 are uniformly positive—that is the Negro mean and median rates are at every age period greater than those for the whites. But in the case of the medians, upon which most reliance may be placed, no difference approaches statistical significance. This is probably chiefly a consequence of the small size of the Negro sample. Tentatively these results may be interpreted to indi-



## Part A. Means

| AGE PERIOD<br>OF EXPOSURE<br>TO RISK OF<br>PREGNANCY | WHITES |            | NEGROES |            | DIFFERENCE | DIFF.<br>P.E. DIFF. |
|--|--------|------------|---------|------------|------------|---------------------|
|  | N      | Mean       | N       | Mean       |            |                     |
| 10-14  | 6      | —          | 2       | —          | —          | —                   |
| 15-19  | 646    | 5.54±.26   | 25      | 11.54±2.04 | +6.00±2.06 | 2.9                 |
| 20-24  | 1,771  | 5.21±.12   | 23      | 11.50±2.36 | +6.29±2.42 | 2.6                 |
| 25-29  | 1,400  | 6.82±.19   | 15      | 6.33±1.21  | -0.49±1.22 | 0.4                 |
| 30-34  | 559    | 8.48±.37   | 5       | —          | —          | —                   |
| 35-39  | 150    | 11.59±.90  | 1       | —          | —          | —                   |
| 40 and over  | 19     | 17.26±3.44 | 0       | —          | —          | —                   |

## Part B. Medians

| AGE PERIOD<br>OF EXPOSURE<br>TO RISK OF<br>PREGNANCY | WHITES |           | NEGROES |           | DIFFERENCE | DIFF.<br>P.E. DIFF. |
|--|--------|-----------|---------|-----------|------------|---------------------|
|  | N      | Median    | N       | Median    |            |                     |
| 10-14  | 6      | —         | 2       | —         | —          | —                   |
| 15-19  | 646    | 0.92±.33  | 25      | 6.50±2.56 | +5.58±2.58 | 2.2                 |
| 20-24  | 1,771  | 2.98±.15  | 23      | 4.50±2.96 | +1.52±2.96 | 0.5                 |
| 25-29  | 1,400  | 3.70±.24  | 15      | 4.13±1.52 | +0.43±1.54 | 0.3                 |
| 30-34  | 559    | 4.51±.46  | 5       | —         | —          | —                   |
| 35-39  | 150    | 6.07±1.13 | 1       | —         | —          | —                   |
| 40 and over  | 19     | 7.50±4.31 | 0       | —         | —          | —                   |

Table 9. Pregnancy rates per 100 computed ovulations in women intermitting the regular, steady, and continuing practice of contraception only for the production of planned children. Women married once only and without any gynecological disease.

cate that operating upon a physiological base of equal fertility in the two races, the same general manner of practising contraception produces results among the Negro women far less effective than even the relatively poor ones the white women are able to achieve.<sup>9</sup>

Attention may now be turned from the mode of contraceptive practice that the present material has shown to be, on the whole, the least intelligent to the most intelligent. Table 9 furnishes the data. It gives the mean and median pregnancy rates for women who (a) intermitted their practice of contraception only for the purpose of producing wanted and planned children when they

<sup>9</sup> For further evidence on this point see Pearl, R.: Fertility and Contraception in Urban Whites and Negroes. *Science*, May 22, 1936, 83, pp. 503-506.

wanted them; (b) had been married once only; and (c) were without any gynecological disease. Let it be emphasized that every single pregnancy entered in Table 9 was a wanted pregnancy, deliberately planned.

It is evident at once from Table 9 that too few of the Negro women in the whole material to be of any statistical use rose to the high level of combined rigid and unfailing self-control, on the one hand, and fairly expert knowledge and aptitude in the recondite field of the physiology of reproduction, on the other hand, that is implicit in the composition of Table 9. So then attention must be confined to the white women.

The median pregnancy rates of the white women in Table 9 had the following percentage relations to (A) the women of Table 7 not practising contraception at all, and (B) the women of Table 8 who did nothing but practise contraception:

| <i>Age Period</i> | <i>Percentage A</i> | <i>Percentage B</i> |
|-------------------|---------------------|---------------------|
| 10-14             | —                   | —                   |
| 15-19             | 11.3                | 19.5                |
| 20-24             | 35.7                | 49.8                |
| 25-29             | 51.7                | 69.3                |
| 30-34             | 72.9                | 92.6                |
| 35-39             | 88.7                | 125.4               |
| 40 and over       | 103.2               | 82.4                |

To facilitate comparison the median pregnancy rates for white women as set forth in Tables 7, 8, and 9 are shown graphically in Figure 3.

These results are not easy of interpretation, and no attempt will be made at this stage of the investigation to express any final or definitive judgment as to their meaning. What they suggest is that these women producing only planned children kept their pregnancies down in the early age periods to very low figures compatible with the wanted small ultimate family size; and that as they got past thirty either the desire for more children got stronger,

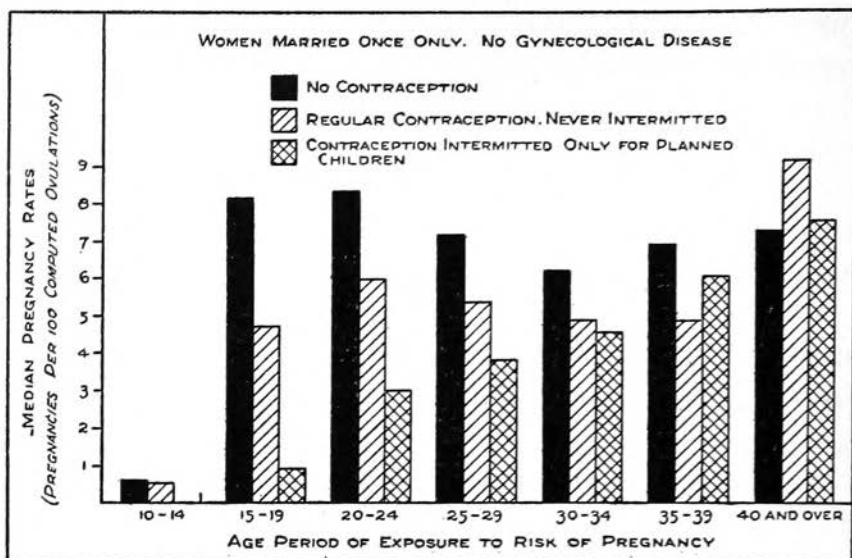


Fig. 3. Median pregnancy rates for white women, by age periods of risk of becoming pregnant, and by different types of contraceptive practice.

or the delay after each interruption of contraception before the wanted pregnancy appeared grew longer and longer, until, in fact, either as a result of one or both of these causes, their actual pregnancy rates were but little below those of women in the same age periods not practising contraception at all. It appears as though among the women included in Table 9 an important psychological factor entered the picture in the later age periods. Their ability effectively to control conception by contraceptive techniques now available is demonstrated by their performance in the earlier age periods. But on the record it seems that as they approached closer and closer to the end of their reproductive lives they *wanted* children at a rate not much different from that at which women who did nothing about contraception *had* children in the same age periods.

v

The more significant points brought out in this progress report may be briefly summarized as follows:

1. The sample of 30,949 women from twenty-six large cities in

fourteen states and the District of Columbia, for which complete reproductive histories are available, appears to be fairly representative of the general population from which it was drawn in respect of relative degree of illegitimacy, religious preference, nativity (native or foreign-born), extent of education, particularly as indicated by percentage of illiteracy, and in all other respects that it has been possible so far to analyze.

2. Of the white women in the sample 10,806, or 42.7 per cent, and of the Negro women 925, or 16.4 per cent, had practised contraception before the time of record, in some manner or other. In total, 57.2 per cent of the white women, and 83.6 per cent of the Negro women denied the practice of contraception, but the statements on this point of 822, or 3.2 per cent, of the white women, and 32, or 0.6 per cent, of the Negro women, were doubted for one reason or another, leaving respectively 54.0 per cent of white and 83.0 per cent of Negro noncontraceptors about whose statements no reason for doubt was found, either in their reproductive histories or in any other circumstance or respect. It is the opinion of the writer, for reasons stated in the body of this paper, that the percentage of white contraceptors in the sample somewhat underestimates the percentage of such women in the general population from which the sample was drawn, but not by a large amount. In his judgment the actual percentage of white contraceptors in the general population from which the sample was drawn is probably of the order of 55 to 60 per cent.

3. An analysis of the mean and median age specific pregnancy rates of women not practising contraception, married once only, and without any gynecological disease, shows that under these conditions the median pregnancy rates of white and Negro women are identical in each quinquennial age period of exposure to risk to pregnancy from 10-14 to and including 40 and over. The same is also true for the age specific mean pregnancy rates, save for two age periods, where the difference between the two racial groups is

probably statistically significant. But in both of these cases the Negro means are *lower* than those for the whites. It is furthermore pointed out that because of the skewness of the rate distributions the median is the more reliable centering constant in the premises.

4. An analysis of the age specific mean and median pregnancy rates of white women practising contraception regularly and steadily throughout their married lives, without intermission of any sort (because they desired no children at all) married once only and free of gynecological disease, shows that this type of contraceptive practice led generally to a reduction of median pregnancy rates below those of noncontraceptors in the same age periods, of only about 20 to 30 per cent on the average. This is interpreted as an expression of the relative lack of intelligence and effectiveness of these women relative to their practice of contraception. Among the Negro women in the same category the reduction of pregnancy rates was insignificantly slight.

5. White women intermitting their practice of contraception *only* for the purpose of producing wanted children deliberately planned to be produced at a particular time, married once only, and free of gynecological disease, reduced their mean and median age specific pregnancy rates below those of noncontraceptors in the same age periods by large amounts in the earlier age periods, but only by small amounts in the later age periods, presumably because in these later age periods their desire for children was not markedly different from their inherent physiological ability to produce them at those ages.