

# The Billings Method of Family Planning: An Assessment

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*The Billings/ovulation method is a periodic abstinence method of regulating births based on the client's interpretation of changing patterns in secretions of cervical mucus monitored by external self-examination. It was developed in Australia and is now widely promoted overseas. This paper outlines the method's recent history and goes on to discuss its physiological basis, its use-effectiveness as measured in a number of major trials, and some evidence concerning its general acceptability and applicability in family planning programs.*

The Billings method,<sup>1</sup> or "ovulation method," is a periodic abstinence method of regulating births and accords, therefore, with the doctrinal position of the Catholic Church. It is based on an interpretation of changes in the cervical mucus, as they are perceived by the woman herself in the course of external self-examination. Essentially, it teaches that when the woman is aware of the presence of mucus she is in the fertile stage of her cycle and that when there are no noticeable mucus symptoms she is infertile. Further, a "peak mucus symptom" is said to mark the day of ovulation. The method was developed in Melbourne, Australia, by Drs. John and Evelyn Billings in the 1960s and early 1970s, and considerable claims have been made for its effectiveness, its general acceptability, and its potential as an eventual solution to the world population problem.

For example, not only is it said to be more accurate than other periodic abstinence methods,<sup>2</sup> it also promises "to eliminate all unwanted pregnancies and consequent demands for abortion."<sup>3</sup> It is said to eliminate problems presented by irregular menstrual cycles and therefore to be appropriate for women who have recently given birth, who are breastfeeding, or who are approaching menopause. (In principle, it should also be effective for adolescents.) Initially, a 100 percent success rate was claimed,<sup>4</sup> although more recently this has been modified to an effectiveness comparable to the pill and the IUD.<sup>5</sup> Further, it is said to be particularly suited to the needs of "the simple and the poor,"<sup>6</sup> and, indeed, to be capable of being used by all couples except those "who are unable to love, or . . . who cannot be taught to love."<sup>7</sup> In addition, it is "free from the bitter side effects, the drastic moral and physical evils that technological means of contraception have imposed upon the world."<sup>8</sup> Only it, or

a method like it, "can hope to answer the problems posed by rapid population growth."<sup>9</sup>

These are large claims. The method has, however, been a focus of controversy in Australia as well as in other countries, among both those who support the Catholic Church's position on birth control and those who do not.

## Recent History of the Method

The Drs. Billings were originally on the medical board of the Catholic Family Planning Centre in Melbourne. This center taught the sympto-thermal method, a periodic abstinence method that relies on changes in basal body temperature, mucus symptoms, and a calculation of pre-ovulatory "safe" days based on the rhythm method. Before 1972 the sympto-thermal method was known locally as the "ovulation method."<sup>10</sup>

By early 1972, John Billings had become convinced that it was possible to rely on mucus symptoms alone to determine a woman's fertile days. He and Evelyn Billings were unable, however, to persuade the other members of the medical board and in consequence resigned from the board in February of that year. They then established a rival periodic abstinence center, called the Natural Family Planning Centre, which taught a method that relied on mucus symptoms alone. John Billings also laid claim to the name "ovulation method" under copyright, defining it as the identification of fertile and infertile days by the mucus symptoms alone.

While the Catholic Family Planning Centre continued to teach the sympto-thermal method, the Church provided the Billings organization with considerable support. The then archbishop of Melbourne, Cardinal Knox, provided rooms in the city and facilitated the establishment of a network of centers at the parish level and in Catholic hospitals. The Billings method was also given considerable prominence as the answer both to the personal problem of fertility control and to any possible

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future world population problem,<sup>11</sup> at the Conference on Population and Ecology, held during the Fortieth International Eucharistic Congress in Melbourne in 1973.

This notwithstanding, the Catholic Family Planning Centre continues to advise patients that mucus symptoms alone are unreliable; Billings method supporters, on the other hand, speak of the "tyranny of the thermometer"<sup>12</sup> and claim that the use of a number of indicators of fertility and infertility leads to anxiety and confusion.<sup>13</sup> At times the tension between John Billings and his former colleagues has risen above the level of a technical difference of opinion. For example, between 1974 and 1976, Johnston, Roberts, and Spencer conducted a major survey of natural<sup>14</sup> family planning services in Australia that evaluated the use-effectiveness of both the Billings and the sympto-thermal methods. Clinics and centers teaching the Billings method in Melbourne refused to take part in the study, even when offered the opportunity to modify questions and procedures that they had considered inappropriate.<sup>15</sup>

The Billings method has also met with criticism in Australia outside the circle of natural family planners, both on the grounds that its reliability is doubtful and on account of the government support it has received. For example, in the mid-1970s it was a subject of inquiry by the Royal Commission on Human Relationships. The commissioners concluded that the method's "effectiveness is open to doubt and we do not consider that it should be promoted to replace other methods."<sup>16</sup>

Although the method originated in Australia, its advocates have in recent years expanded their activities considerably. In 1976 Dr. Kevin Hume, in a spirited defense of the method, maintained that, both as a birth control technique and as a "philosophy of life," the Billings method was now international and thus beyond the reach of local criticism.<sup>17</sup> It now seems that he was right. The World Organization Ovulation Method—Billings (WOOMB), an international body, was established in Los Angeles in 1977, both to patent the method and to promote it. And in 1978, an international conference was held in Melbourne to commemorate the work of John Billings and to consider it in the light of Catholic teaching and *Humanae Vitae*. Eight hundred delegates attended from 47 countries, and Pope Paul VI sent a message of strong encouragement and support. Professor Elizabeth Anscombe, Dr. Colin Clark, and Mother Teresa were among the many who presented papers.<sup>18</sup>

Since then, the World Health Organization has completed a multicentric trial of the method, and Evelyn Billings and Ann Westmore's book, *The Billings Method*, has become an international success. While 70,000 copies have been sold in Australia alone, rights have also been sold in 19 countries, including Great Britain, Germany, France, Japan, India, the Philippines, Hong Kong, Malaysia, and Brazil, and the book has been translated into 12 languages. The United States rights were sold for US \$117,500, a record for an Australian book, and as of September 1984, over half a million copies had been sold outside the Australian market.<sup>19</sup>

Since 1977, WOOMB has led a "crusade which has established teaching centres in more than 100 countries."<sup>20</sup> These include European and North American countries, but the majority are concentrated in Central and South America, Africa, South and Southeast Asia, and the Pacific Islands. In addition, the natural family planning lobby, with its strong opposition to abortion and to artificial contraception, has been active in lobbying the US Congress and the Reagan administration to reduce international aid for population programs. This pressure, combined with the activities of other groups hostile to population programs, has had some impact, particularly on the new conservative members of Congress.<sup>21</sup>

The Billings method is, then, being actively promoted in the less developed areas of the world, where population growth generates considerable concern. Its promoters, moreover, are not only strongly convinced of its merits, they are equally strongly committed to an ideological position that condemns the use of most other methods.

An explanation for their international success in establishing programs and disseminating information can probably be derived from two rather different sets of causes: first, and most important, the institutional base offered by the Catholic Church,<sup>22</sup> and, second, anxiety about the side effects of chemical and some mechanical birth control devices. Anxiety of this sort is frequently combined, at least in the West, with desires to create a simpler and more natural life-style. The papers delivered at the 1978 Melbourne conference, *Human Love and Human Life*, exemplify the first set of causes; the popular book *The Billings Method* exemplifies the second. The book makes no mention of Catholicism, but rather emphasizes the dangers of established methods of birth control and the virtues of being close to nature, with "the sense of wonder and deep satisfaction that comes from tuning in to the natural rhythms of your own body" (Billings and Westmore, p. 15).

Links could also be made between the women's movement's concern about high-technology, male-dominated medicine and the acceptance of an ostensibly simple method presented to women by women. (Billings method teachers are usually women with no particular training except expertise in the method and in imparting it to others.) The high expectations of a contraceptive panacea that were raised by the contraceptive pill and the subsequent disillusionment many women felt when it failed to meet all these expectations<sup>23</sup> could also be a factor. The pill introduced into Western culture, for the first time, the idea that perfect contraception was a possibility, and its failure to live up completely to this promise was seen largely as a consequence of its chemical "unnaturalness." One could then argue that many people, with their newly aroused expectations of a perfect contraceptive undiminished, would have been receptive to the claims of a method that was promoted not only as safe and effective but as supremely natural.

This paper, however, is concerned not with expla-

nations for the method's increasing international prominence, but with old questions that this success renders more urgent. Is the method as effective as it is claimed to be? And does this matter?

## Effectiveness

An evaluation of the method's effectiveness involves two separate issues: the question of whether mucus symptoms are a reliable indicator of fertile and infertile days, and the problem of abstinence. This distinction should not, however, be seen as a basis for distinguishing method failures from user failures and discounting the latter. In the first place, it is difficult to say in what sense one category of failures are method failures and others user failures: most methods of contraception involve instructions to users, and these, like the instruction to practice abstinence, must be seen as a part of the method.

It is of course legitimate, and in many cases necessary, to distinguish between the biological basis of a method and the problems people have in using it, but this is a rather different distinction. The biological basis and the instructions to the user are both part of the method, and when it has been developed to the stage of being tested in a major trial, maintaining a distinction between them is often not particularly helpful. What we wish to know is how effective the method is in preventing pregnancies in actual practice.

The central concept, then, becomes that of use-effectiveness and, as Tietze and Lewit explain it, this subsumes not only the method's antifertility effect (i.e., its capacity to prevent pregnancies) but also its acceptability, which is reflected in the rate of continued use.<sup>24</sup>

Supporters of the Billings method, however, wish to maintain a distinction between method and user failures, with method failures defined as only those that can be shown to be due to weaknesses in the biological basis of the method.<sup>25</sup> In this way, high failure rates (see section below on method trials) can be explained in terms of the inadequacies of the user rather than in terms of the inadequacies of the method. This may make proponents feel more comfortable, but, unfortunately, it does nothing to reduce the incidence of unplanned pregnancies.

Whatever the merits of attempting to maintain this distinction, researchers do appear to experience methodological problems, even in carefully controlled trials, in obtaining the kind of data they would need if pregnancies were to be accurately classified in terms of biological and user failures (see the discussion of the WHO-sponsored trial, below). Billings himself writes of difficulties in persuading couples to produce the information about their sexual activities that would enable pregnancies to be classified in this way: "There are many reasons why this behaviour is concealed . . ."<sup>26</sup>

Difficulties with abstinence also make a considerable contribution to the failure rates of periodic abstinence methods, but, in practice, the precise dimensions of this contribution can be hard to ascertain. It is, however, well

worth inquiring further into the biological basis of the method so that we can ask the hypothetical question: If couples had no difficulty with abstinence and were able to follow the instructions unswervingly, would the Billings method be reliable for them?

## The Biological Basis: Self-Monitored, External Mucus Symptoms

John and Evelyn Billings claim that the main advantage of their method over other periodic abstinence methods is that it allows couples to predict the occurrence of ovulation so that they may have intercourse during pre-ovulatory "safe" days without fear of pregnancy. Evelyn Billings and Ann Westmore state confidently that mucus is produced "for an average of six days before ovulation," and they further claim that studies show that the type of mucus they describe as the peak symptom "usually occurs within a day of ovulation."<sup>27</sup> This is important because identification of postovulatory "safe" days depends on the recognition of the peak symptom.

If these claims about mucus symptoms could be substantiated, they could amount to an advance for periodic abstinence methods because the time span during which abstinence must be observed could, in certain cases, be reduced.<sup>28</sup> A method that is ovulation specific and that gives adequate warning of the approach of ovulation would be especially helpful during the long and irregular cycles associated with childbirth, breastfeeding, and menopause. A crucial factor here is, of course, sperm survival time. The limits of this are not yet exactly known, but Johnston et al. consider that sperm may remain viable for five or even six days and that a woman must have, at the very least, five days warning of the approach of ovulation to be sure of avoiding pregnancy.<sup>29</sup>

The questions then are these: Do all, or most, fertile women experience regular mucus symptoms in a form that they can check for themselves? Do these symptoms appear early enough in the cycle to give them sufficient warning of the approach of ovulation? And does the so-called peak symptom coincide with the day of ovulation? The scientific basis of the method depends on an affirmative answer to these questions.

This paper presents evidence concerning the biological basis of the Billings method drawn from five studies. Four of these were conducted with the principle aim of investigating the biological basis of this method (E. L. Billings et al., 1972;<sup>30</sup> Marshall, 1975;<sup>31</sup> Flynn and Lynch, 1976;<sup>32</sup> Hilgers et al., 1978<sup>33</sup>); the fifth investigated it as a part of a wider study of the effectiveness of this and other natural methods (Johnston et al., 1978<sup>34</sup>).

Marshall and Johnston et al. have accumulated the most systematic, wide-ranging, and apparently reliable data. Their research will therefore be discussed first. Marshall's study, however, has been criticized by Billings method supporters on two grounds: the women were taught by correspondence, and, because they were recording temperature shifts as well as mucus changes,

they would have paid insufficient attention to the mucus symptom.<sup>35</sup> The study by Johnston et al., however, is not open to these criticisms. All the women described had received personal instruction, and data are presented on women who were not recording temperature changes, as well as on women who were. Therefore, some judgment on whether the criticisms do in fact invalidate Marshall's findings can be made when these findings are compared with those presented by Johnston et al.

Marshall's study followed 166 women through 1,800 cycles. The women were established on the basal body temperature method but were asked to record their mucus symptoms as well. The results showed mucus symptoms to be erratic. Of the women studied, 75 percent observed mucus in every cycle, 21 percent in some cycles only, and 4 percent never observed it. When mucus was observed, it was not always present on consecutive days. In all, mucus was observed in 1,489 cycles (82.7 percent) and not observed in 189 cycles (10.5 percent), while in a further 122 (6.8 percent) the woman was ill or forgot to record whether or not mucus was present. In the 1,489 cycles where mucus was observed, it appeared most commonly 19–14 days before the end of the cycle (the norm being 16), but an appreciable number of cycles were outside this range.

In the 1,456 cycles where mucus symptoms and a rise in basal body temperature were observed, data are presented for the time of the first mucus observation in relation to the rise in temperature. In 38 percent of these cycles, mucus symptoms began six or more days before the rise in temperature; in 30 percent of cycles, four or five days before; and in 32 percent of cycles, three or fewer days before (19.4 percent three to two days before; and 13.1 percent from one day before to more than one day after). All but four of the 189 cycles without mucus showed a biphasic temperature curve, which indicated that the women were in fact ovulating, and three women conceived during cycles in which they observed no mucus at all.

From their total sample of 1,724 couples using natural methods, Johnston et al. present data describing the experience of a subsample of 200 sympto-thermal method users through 1,772 cycles. Because the women in this group had been taught to record both temperature changes and changes in mucus symptoms, their experience is comparable with that of the women in Marshall's study.

Of these women, 62 percent observed mucus in every cycle, and 30 percent in some cycles; 8 percent were unable to recognize it in any cycle. Only 26 percent of the women consistently identified a mucus pattern for five days before the so-called peak symptom, which the authors, for the purpose of this portion of their report, take to represent the putative time of ovulation. Fifty-four percent recorded a five-day pre-peak pattern in some cycles, and 20 percent never recorded this pattern.

Johnston et al. then go on to present data describing the mucus patterns recorded by a subsample of Billings method users, who, of course, were not recording temperature shifts. "To qualify, the users had to have been

instructed by female lay teachers, and to have had a minimum of eight cycles of use . . . All had to have observed cervical mucus discharge patterns in all cycles recorded and to have discerned a peak . . ." (p. 363). One thousand cycles from women who met these criteria were then analyzed. Fewer than 10 percent of the women could "consistently or regularly record a five day mucus run to peak," while a further 53 percent recorded this pattern for 60 percent of their cycles (p. 371). "Put another way, only half the women surveyed managed to record a five day pre-ovulatory mucus run to peak, and this in only half the cycles recorded" (p. 371). The researchers also matched this group of Billings method users with a comparative group of sympto-thermal users who were calculating early "safe" days on the basis of mucus symptoms. They found that the Billings method users were no more proficient at identifying and interpreting mucus symptoms than were women who were also taking temperatures.<sup>36</sup>

The studies presented by E. L. Billings et al.,<sup>37</sup> Flynn and Lynch,<sup>38</sup> and Hilgers et al.<sup>39</sup> are very much more restricted in scope. Here the woman's subjective interpretation of mucus symptoms is correlated with a time of ovulation based on laboratory analysis of hormone levels. In all cases, the numbers of women involved are small and the duration of the study brief. In two cases (E. L. Billings et al. and Hilgers et al.), the subjects are drawn from patients attending natural family planning clinics who would have had a degree of familiarity with the method, the symptoms they were expected to discover, and the days on which these were to be looked for. In the third case (Flynn and Lynch), women who had never experienced mucus symptoms were excluded from the study. Although these methodological considerations necessarily mean that we cannot generalize from these studies to the population of fertile women as a whole, the results, nonetheless, do not support the method's physiological claims.

Billings et al. studied 22 women through one menstrual cycle. They defined the day of ovulation as the day after the midcycle peak in plasma luteinizing hormone. Although the results showed that the average (mean) interval from the onset of mucus symptoms to the day of ovulation was 6.2 days, the range was from 3 to 10 days. Ovulation occurred on the average (mean) 0.9 days after the occurrence of the peak symptom, but the range was from 3 days after to 2 days before.

Flynn and Lynch studied nine women through 29 cycles (seven were observed for 3 cycles and two for 4 cycles). Taking the day when luteinizing hormone (LH) was at its peak as the time of ovulation, they found that, while on the average (mean) mucus symptoms were first observed 5.2 days before the LH peak, in 20 cycles they began 5 days or more before the LH peak and in 9 cycles 4 days or less before. They also correlated the day of maximum mucus grading (the peak symptom) with the LH peak. On the average (mean), the day of maximum mucus grading was observed 0.45 days before the LH peak; in 3 cycles it was observed 2 days before, in 10

cycles 1 day before, in 13 cycles on the same day, and in 3 cycles 1 day after.

Hilgers et al. studied 24 women drawn from a natural family planning center through 74 cycles (from 2 to 4 cycles each). From the authors' report, it is difficult to estimate the degree of prior knowledge the women would have had of "typical" mucus patterns. On the one hand, they had to have had a six-month history of regular cycles to be included in the study, which indicates an association with the center of at least this duration. On the other hand, they were formally taught the Billings method after they had been selected. Whatever their prior knowledge, however, the study does not appear to have been designed to minimize the chances of producing artificial results.

The authors were particularly concerned with the peak symptom and its relationship to the time of ovulation. Of the 74 cycles, 1 was excluded because the mucus observations appeared to be unreliable and 8 because the cycles appeared either to be anovulatory or to portray an inadequate luteal function; of the remaining 65, 64 exhibited a peak symptom. In 95.4 percent of these 64 cycles, the estimated time of ovulation was from 2 days before to 2 days after the peak symptom, and the range was from 3 days before to 3 days after. In 2 cycles, the estimated day of ovulation was a day on which no mucus was recorded at all. The authors also found that, although the beginning of the mucus symptoms preceded the time of ovulation by an average (mean) of 5.9 days, there was a range of 0–15 days.

The authors of this study are certainly in sympathy with the method's claims. Hilgers himself presented three papers to the 1978 Melbourne conference and, in one of them, "An Obstetrician Looks at Natural Family Planning," warmly endorsed the teaching of *Humanae Vitae*. He is also reported on the cover of the 1982 Australian edition of Billings and Westmore's book as saying that "the Billings Method will be recognised in medical history as one of the greatest discoveries of this century." In this study, however, he and his coauthors conclude that, although the effort is well justified, "more work needs to be done to further clarify the method's application and the role of cervical mucus in the natural fertility process . . ." (p. 581).

The evidence does not support a conclusion to the effect that all, or most, fertile women always experience mucus symptoms, that these symptoms will precede ovulation by at least five days, and that a peak symptom will mark the day of ovulation. On the average and in general, many women may well experience a changing pattern of mucus symptoms, but we cannot say that these mark the fertile period with sufficient reliability to form the basis of an effective method of birth control. This means that, problems with abstinence apart, the Billings method will be inherently unreliable for a substantial number of women. In fact, the data presented by Johnston et al. suggest that it is possible that the women who are able to depend on it for consistently reliable information about their fertility may be in a minority.

## Trials of the Method

What, then, are the results when the method is tested in actual practice? One of the major field trials that also investigated the biological basis (Johnston et al., 1978) has already been mentioned. This, together with four other trials (Weissman et al., 1972;<sup>40</sup> Wade et al., 1979;<sup>41</sup> Medina et al., 1980;<sup>42</sup> WHO, 1981<sup>43</sup>), will be discussed below for the light they can shed on the method's use-effectiveness.

The earliest trial (Weissman et al., 1972) took place in the islands of Tonga and involved 282 couples who used the method for a total of 2,503 cycles. At the end of the study period, 81 of the women were pregnant. The researchers include only three of these pregnancies in their discussion of the method's effectiveness: 50 women are considered to have broken the rules, "deliberately or carelessly," and 28 to have planned their pregnancies. Many authors have criticized this interpretation and insisted that the 50 pregnancies said to be due to rule breaking should be included in a discussion of the method's effectiveness.<sup>44</sup> If this is done, the study shows a failure rate of 25.4 pregnancies per 100 woman-years by the Pearl formula.

Wade et al.<sup>45</sup> conducted a comparative study in Los Angeles of the Billings method and the sympto-thermal method. They interpret their results using the life table technique rather than the Pearl formula. The 838 couples involved were randomly assigned to two groups: One group was supervised in the practice of the Billings method, the other in the sympto-thermal method. By the end of the first year following enrollment in training, 75.9 percent of Billings method users had terminated use of the method (22.9 percent because of accidental pregnancy) and 64.7 percent of sympto-thermal method users had terminated (11.2 percent because of accidental pregnancy). Table 1 sets out the results both for the first 12

**Table 1** Los Angeles Study: Percentages of women terminating use of their method, by time of termination and by reason

Method and time of termination	Accidental pregnancy	Voluntary withdrawal	Other	All reasons
By end of first year following enrollment in training				
Billings method	22.9	46.1	6.9	75.9
Sympto-thermal method	11.2	44.7	8.8	64.7
By end of first year following enrollment in study				
Billings method	24.8	36.6	8.3	69.7
Sympto-thermal method	9.4	26.2	9.6	45.2

**Source:** Tables II and III, Wade et al., "A randomized prospective study of the use-effectiveness of two methods of natural family planning: An interim report," *American Journal of Obstetrics and Gynecology* 134, no. 6 (July 1979):628–631.

months following enrollment in training and for the first 12 months following enrollment in the formal study. The training phase lasted from three to five months, and termination rates were high (54 percent of Billings method users and 49 percent of sympto-thermal method users withdrew during training). If an analysis of the results is confined to those couples who successfully completed the training phase and entered the formal study, the proportion of Billings method users becoming accidentally pregnant actually increases.

Table 1 illustrates a clear difference in the antifertility effect of the two methods, showing the Billings method to be much less effective. The study is particularly interesting because the fact that participants were randomly assigned to the two groups provides a control for the effect of abstinence. That is, as both methods involve periodic abstinence, the higher failure rate experienced by the Billings method group can be best explained in terms of the relative inadequacy of the mucus symptoms. The difference is unlikely to be attributable to inadequate teaching; all teachers were trained for at least three months and John and Evelyn Billings participated in the training program. Once the markedly greater effectiveness of the sympto-thermal method had become apparent, medical ethics obliged the researchers to inform the participants. Many of the couples who had been randomly assigned to the Billings method group then switched to the sympto-thermal group, and the study had to be terminated.<sup>46</sup>

It appears, then, from this study, that couples who rely on mucus symptoms alone to determine the fertile period experience greater difficulties than those who use a combined method. Both groups, however, experienced high failure rates, and the discontinuation rates indicate that neither method was found to be particularly acceptable.

The study by Medina et al.<sup>47</sup> in Colombia is similar in design to the Los Angeles study in that couples were randomly assigned to either the Billings method or the sympto-thermal method. The results are set out in Table 2. Accidental pregnancy rates are comparable to those in the Los Angeles study for the Billings method but not for the sympto-thermal method. Here failure rates are high for both methods, and although the recorded figures are slightly lower for the sympto-thermal method, the researchers did not find the difference to be statistically significant.

Pearl rates by the end of the first year following the start of training were 37.2 pregnancies per 100 woman-years for the Billings method and 34.4 for the sympto-thermal method. By the end of the first year following the start of the study phase, they were 33.8 for the Billings method and 26.0 for the sympto-thermal method. In contrast to the results of the Los Angeles study, these results do not enable us to draw firm conclusions about the reliability of the mucus symptom versus the reliability of the range of symptoms employed by the sympto-thermal method. Medina et al. report that cultural factors make abstinence difficult to practice in Colombia. It could

**Table 2** Colombia Study: Percentages of women terminating use of their method, by time of termination and by reason

Method and time of termination	Accidental pregnancy	Voluntary withdrawal	Other	All reasons
End of first year following enrollment in training				
Billings method	22.2	34.3	15.6	72.1
Sympto-thermal method	19.1	38.4	19.2	76.7
End of first year following enrollment in study				
Billings method	24.2	30.3	5.6	60.1
Sympto-thermal method	19.8	26.0	7.3	53.1

**Source:** Tables III and IV, Medina et al., "Comparative evaluation of two methods of natural family planning in Colombia," *American Journal of Obstetrics and Gynecology* 138, no. 8 (December 1980):1142-1147.

be that greater problems with abstinence in this study obscure underlying differences in the relative reliability of the two methods. That is, if neither group is following the rules of abstinence particularly carefully, the relative merits of the physiological bases of the methods cannot be said to have been tested.

The Australian survey conducted by Johnston et al. (1978)<sup>48</sup> produced a further range of results that allow comparisons between the two methods. From their total sample of 1,724 natural family planning clients, the authors selected 1,132 couples for their final use-effectiveness analysis.<sup>49</sup> Sampling criteria did not exclude women with a history of irregular cycles. Billings method users contributed 6,499 prospective cycles, and sympto-thermal users 7,763. The latter were subdivided into two groups: variant A, where preovulatory "safe" days were estimated on the basis of the calendar rhythm method (3,168 cycles), and variant B, where preovulatory "safe" days were estimated on the basis of mucus symptoms (4,595 cycles).

Life table data are presented with reference to pregnancy only, and no distinction is made between a training phase and a study phase. Users, however, were monitored for a longer period than in the Los Angeles or the Colombia study. Table 3 presents data on the cumulative proportions accidentally pregnant at 13 cycles and at 26 cycles. At both stages, results indicate a higher proportion pregnant for the Billings method and also suggest that variant B of the sympto-thermal method may, in the long term, be less reliable than variant A. The Pearl rates illustrate these differences more strongly: The rates (per 1,300 cycles) were 34.8 pregnancies per 100 woman-years for the Billings method, 13.13 for variant A of the sympto-thermal method, and 20.08 for variant B.<sup>50</sup> (Tests of statistical significance are not appropriate because the study was not set up as a controlled experiment.)

In order to evaluate the likelihood of a couple con-

tinuing with a particular method, the authors selected a number of use episodes in numerical sequence from their computer list; 478 of these referred to the experience of Billings method users and 372 to that of sympto-thermal method users. If at the end of the time period surveyed a woman was still using the method she had been established on, she was classified as continuing. If she was pregnant or breastfeeding and intending to return to the method, or if she was ambivalent about whether she would do so, she was also classified as continuing.<sup>51</sup> The inclusion of ambivalent women certainly biases the measures in favor of continuity, but this notwithstanding, discontinuation was common for both methods. In 30 percent of the episodes studied, the method used was eventually abandoned.

Discontinuation was, however, very much higher in episodes where the Billings method was used. In 47 percent of these, the women gave up the method. In comparison, 20 percent of sympto-thermal method use episodes ended in discontinuation. When women who had abandoned the Billings method were interviewed, many claimed that the method was "too complicated" or "too difficult to apply," had "too many rules to follow" or "too many qualifications to remember."<sup>52</sup>

Overall, the authors conclude that "adherence to natural methods . . . appears for many to be somewhat fragile." A third of the women in the survey had used artificial methods in the past, and 61 percent of those who dropped out of the study stated an intention to use them in the future.<sup>53</sup>

The Australian study has been subjected to an extensive critical analysis by Hilgers, who concludes that the work is methodologically unsound.<sup>54</sup> The authors reply that much of the criticism is based on "the unwarranted assumption that what we attempted was an experimental prospective study. . . where tight methodological procedures are essential." They do not, however, present their work as this. Rather, it is a survey of "what was happening in NFP [natural family planning] in a particular place and over a specific time period."<sup>55</sup>

The studies conducted by Wade et al. (1979), Medina et al. (1980), and Johnston et al. (1978) have been dis-

cussed at some length, not only because they present a range of data on the use-effectiveness of the Billings method, but also because they present comparable data on the sympto-thermal method. This allows some conclusions to be drawn about the relative reliability of the two methods. In all three cases, the Billings method has a higher failure rate than the sympto-thermal method, and in two of the three studies, the difference is quite marked. The most plausible explanation for the difference is that the mucus symptom alone is a less reliable indicator of the fertile period than is the range of symptoms employed by the sympto-thermal method.

The fifth and final study to be discussed is the trial sponsored by the World Health Organization (WHO). It was a trial of the Billings method alone and involved 869 couples drawn from five different centers: Dublin, Auckland, Manila, Bangalore, and San Miguel (El Salvador).<sup>56</sup> Selection criteria minimized the chances of including women with irregular cycles, and, although this means that many of the very women for whom the method is said to be particularly useful were excluded, it diminished one source of serious difficulty for periodic abstinence methods. After 16 cycles (including a 3-cycle teaching phase and a 13-cycle effectiveness phase), the study showed a cumulative net probability of discontinuation of 45.9 percent, 23.9 percent due to pregnancy. If analysis is confined to the 13-cycle effectiveness phase, the cumulative net probability of discontinuation is 35.6 percent, 19.6 percent due to pregnancy.

Using a modified Pearl formula (per 1,300 cycles), the study showed an overall failure rate of 22.3 pregnancies per 100 woman-years, ranging from 31.0 in Auckland to 19.0 in Bangalore (see Table 4).

The study also makes a distinction between failures by type, so that an attempt may be made to distinguish "method" failures from "user" failures. "Method" failures, which is to say failures attributed by the researchers to biological weaknesses in the method, varied sharply between the centers. Table 4 sets out the pregnancy rates by classification and by center and shows that "method-related" failures were considerably higher in Dublin and Auckland, the two centers in the developed world, than they were in the other three countries.

The pattern is more marked in the results of the effectiveness phase only than in the results of the study as a whole (teaching phase plus effectiveness phase). In the effectiveness phase, as Table 4 shows, "method-related" failures were 5.1 per 100 woman-years in Dublin, 9.4 in Auckland, 1.1 in Manila, and 0 in Bangalore and San Miguel. A corresponding pattern can be discerned in pregnancies attributed to an "inaccurate application of instructions." Pregnancy rates by this category, for the effectiveness phase, were 3.2 in Dublin, 13.5 in Auckland, 0 in Manila, 3.1 in Bangalore, and 0 in San Miguel. None of the women in Auckland were illiterate, and 37 percent had had at least some tertiary education. In San Miguel, 48.1 percent were illiterate, and only 0.6 percent (one woman) had any tertiary education. Despite this,

**Table 3** Australian Study: cumulative rate per 100 users accidentally pregnant at 13 and at 26 cycles, by method

Method	Cumulative rate per 100	
	At 13 cycles	At 26 cycles
Billings	26.4	45.0
Sympto-thermal		
Variant A	14.3	35.7
Variant B	13.3	39.0

**Source:** Table 4.15, Johnston et al., *A Survey Evaluation of the Efficacy and Efficiency of Natural Family Planning—Report of a Research Project* (Sydney: St. Vincent's Hospital, 1978), p. 296.



**Table 4** WHO Study: pregnancy rates of Billings method users for entire study and for effectiveness phase only, by center and by cause of pregnancy (modified Pearl rate: per 1,300 cycles)

Cause of pregnancy	Dublin	Auckland	Manila	Bangalore	San Miguel	All centers
Entire study						
Method-related	3.7	6.8	0.8	0.5	0.0	2.2
Inaccurate application of instructions	3.7	12.6	0.8	2.8	2.4	3.9
Conscious departure from the rules	9.3	9.7	15.5	15.2	30.8	15.4
Total <sup>a</sup>	17.7	31.0	17.9	19.0	33.2	22.3
Effectiveness phase only						
Method-related	5.1	9.4	1.1	0.0	0.0	2.8
Inaccurate application of instructions	3.2	13.5	0.0	3.1	0.0	3.5
Conscious departure from the rules	10.2	9.4	11.6	15.9	32.8	15.4
Total <sup>a</sup>	19.7	33.6	13.8	19.6	32.8	22.5

<sup>a</sup> Includes minor categories of "inadequate teaching" and "uncertain."

Source: Table 4, WHO, "A prospective multicentric trial of the ovulation method of natural family planning. II. The effectiveness phase," *Fertility and Sterility* 36, no. 5 (November 1981):591-598.

the results appear to show that the women in Auckland had far greater difficulty understanding the instructions than did the women in San Miguel.

Curiously, if we take development/underdevelopment as the basic underlying variable, failures attributed to a "conscious departure from the rules" vary in the opposite direction to failures attributed to the "method" or to an "inaccurate application of the instructions." During the effectiveness phase, the pregnancy rate for the category "conscious departure from the rules" was 10.2 in Dublin, 9.4 in Auckland, 11.6 in Manila, 15.9 in Bangalore, and 32.8 in San Miguel. If it existed on its own, it might be possible to explain this particular pattern in terms of greater problems with abstinence in less developed countries (due perhaps to male dominance, or to problems with migratory work patterns and the chance that the brief time spouses might have together would not correspond with the infertile period). But explanations of this kind do not account for higher failure rates attributed to the "method" or to "inaccurate application of instructions" in the developed countries.

A plausible explanation for the overall recorded pattern could be that women in the developed world are less likely to be convinced that failures are their own fault and more likely to assert inadequacies in the method or in the instructions that they have received. A more assertive attitude such as this could make it less likely that their pregnancies would be unequivocally classified as due to a "conscious departure from the rules," and more likely that a compromise would be reached and the women would be classified as not having understood the instructions. If this is so, it would mean that the WHO data on failures by category are unreliable. And further, it would suggest that, whatever the theoretical merits of distinguishing between biological failures and failures due to problems with abstinence, an attempt to make the distinction will in practice be fraught with methodological difficulties.

We can make inferences about biological failure rates

in trials where subjects are randomly assigned to two groups, each practicing a periodic abstinence method and receiving the same degree of personal attention, but each using a different indicator of the fertile period—one using mucus symptoms, the other something else. This cannot tell us the absolute magnitude of the biological failure rate in either group, but it can demonstrate that the biological failure rate is relatively higher for one method than it is for the other. Attempts to distinguish between biological and user failures in any one particular trial do not, however, seem to be helpful. Interviewing women who become pregnant and quizzing them about their diligence in using the method and the nature and timing of their sexual activities seems, on the face of it, likely to produce unreliable data. The results of the WHO trial suggest that this is indeed the case.

Whatever the relative contribution of biological and user failures, the overall failure rate for the Billings method is high. And, although we cannot outline its precise dimensions, it appears from Wade et al. and Johnston et al. that the biological failure rate for the Billings method is, at the least, higher than that of the sympto-thermal method.

Subjects for special trials of a contraceptive method are subject not only to selection procedures but also to more personal attention than people in their position would receive in the normal course of events. Despite this, the four studies of the Billings method where relevant data are presented show that discontinuation was common, and all five studies discussed show high accidental pregnancy rates. The low use-effectiveness of the method is highlighted if we compare these pregnancy rates with those for other contraceptive methods in general use. Vaughan et al. present the following pregnancy rates for married women in the United States during the first year of use of the method indicated: 2 percent for the pill; 4 percent for the IUD; 10 percent for the condom; 13 percent for the diaphragm; 15 percent for foams, creams, and jellies; and 19 percent for rhythm.<sup>57</sup>



**Table 5** Use-effectiveness data for selected studies, by method

Method	Tonga <sup>a</sup>	Los Angeles <sup>b,c</sup>	Colombia <sup>c,d</sup>	Australia <sup>e,f</sup>	WHO <sup>g</sup>	Philippines <sup>h</sup>	United States <sup>i</sup>
Billings method	25.4	34.9–39.7	37.2–33.8	34.8	22.3–22.5	—	—
Sympto-thermal method	—	16.6–13.7	34.4–26.0	13.1 (A) 20.1 (B)	—	—	—
Rhythm (calendar)	—	—	—	—	—	20.2	19
Pill	—	—	—	—	—	7.8	2
IUD	—	—	—	—	—	2.6	4
Condom	—	—	—	—	—	21.3	10

**Note:** Pearl rates are used except for US data, see footnote i.

<sup>a</sup> Calculated from Weissman et al., "A trial of the ovulation method of family planning in Tonga," *The Lancet* (October 14, 1972): pp. 813–816.

<sup>b</sup> Wade et al., cited for Table 1. Pearl rates are taken from Liskin, "Periodic abstinence: How well do new approaches work?" *Population Reports*, series 1, no. 3 (1981):43, 46.

<sup>c</sup> The first figure is calculated from the year beginning with the start of the training phase, the second from the year beginning with the start of the study phase.

<sup>d</sup> Medina et al., cited for Table 2.

<sup>e</sup> Johnston et al., cited for Table 3, p. 290 (Table 4.12). The first figure for sympto-thermal data is for variant A, where early safe days were designated by calendar rhythm, and the second figure is for variant B, where early safe days were designated by mucus symptoms.

<sup>f</sup> Per 1,300 cycles.

<sup>g</sup> WHO, "A prospective multicentric trial of the ovulation method of natural family planning: 1. The teaching phase," *Fertility and Sterility* 36, no. 2 (August 1981) and WHO, cited for Table 4. The first figure is for the teaching and effectiveness phases together, the second for the effectiveness phase alone.

<sup>h</sup> J.E. Laing, "Natural family planning in the Philippines," *Studies in Family Planning* 15, no. 2 (March/April 1984):49–61.

<sup>i</sup> B. Vaughan et al., "Contraceptive failure among married women in the United States, 1970–1973," *Family Planning Perspectives* 9, no. 6 (November/December 1977). Figures represent the percent pregnant during the first year of use of the method (life table technique).

Although Hatcher et al. suggest that a failure rate of 0.04 percent is typical for tubal ligation and 0.15 percent for vasectomy,<sup>58</sup> no failures were recorded for sterilization. The rates were computed, using the life table technique, from data describing 6,302 intervals of contraceptive use among married women in the US 1973 National Survey of Family Growth.

These rates, however, may not be achieved with the same methods in a different cultural and economic context. Laing presents data drawn from the 1976 National Acceptor Survey in the Philippines describing the use-effectiveness of calendar rhythm, the pill, the IUD, and the condom in that country.<sup>59</sup> Table 5 sets out these together with use-effectiveness data from the studies discussed above. It suggests that although such methods as the pill, the condom, and the sympto-thermal method may be more effective in the developed countries than they are in the less developed countries, the effectiveness of the Billings method appears relatively poor in both contexts.

This pattern is consistent with the evidence on the method's biological basis. It adds further support to the position outlined above that the method's high failure rate is not simply due to problems with abstinence but also to an underlying unreliability in self-monitored, external mucus symptoms as an indicator of fertility and infertility.

## Discussion

Despite the fact that the Billings method originated in Melbourne and has been enthusiastically promoted in Australia, few Australians who practice contraception use this, or any other, periodic abstinence method. Johnston et al. estimate that only one in a thousand women in the fertile age range are likely to adopt a natural method in a given year, and they also predict that this acceptance rate is likely to decline.<sup>60</sup> A 1978 survey of 932 contraceptors (men and women, married and unmarried) found that 1.1 percent were using the Billings method, 0.4 percent the temperature method, and 1.9 percent the rhythm method. The major methods were the pill (53.1 percent), sterilization (21.6 percent), and the IUD (10.7 percent).<sup>61</sup>

A 1977 survey of 593 married women in Melbourne (almost all of whom were practicing contraception) discovered a similar pattern. Data are presented for varying age group categories and show that use of rhythm varied from 7 to 1 percent, and use of "sophisticated rhythm" (presumably any variant of the new approaches to periodic abstinence) from 3 to 1 percent. In contrast, pill use varied from 74 to 30 percent, and sterilization from 32 to 0 percent.<sup>62</sup>

Data on contraceptive use do not, then, suggest that the Billings method is likely to be widely used in Australia. Although the promotion of the method will mean

that individuals may suffer unplanned pregnancies and that scarce resources for family planning will be misallocated, in an advanced industrial society with an educated population and relative availability of effective methods, the influence of the Billings method is likely to be limited.<sup>63</sup>

Similarly, in the less developed countries, relatively few couples are likely to adopt the Billings or the symptothermal method. Extraordinary efforts, over a period of nearly three years, were required to recruit the 1,240 couples who eventually took part in the Colombia study. Initially, lectures were delivered to health workers, priests, and church officials asking them to refer potential participants. This proved inadequate, and a further 372 lectures were given to audiences totaling over 18,000 people. More than 61,000 pamphlets were distributed; extensive use was made of the mass media; and 20,000 home visits were made—including those to participants during the study. In Liberia, family planning personnel were trained to teach the Billings method and the symptothermal method, but they had so few clients that they eventually lost their competence.<sup>64</sup> And Laing, reporting on a study in the Philippines designed to test the relative effectiveness of calendar rhythm and the Billings method, writes that the researchers experienced “considerable difficulty in finding potential acceptors of either method willing to undergo instruction.”<sup>65</sup>

Given the relative popularity of calendar rhythm in the Philippines, this latter finding is curious. Laing reports survey data that show that, after withdrawal (practiced by 9.5 percent of married couples), calendar rhythm (practiced by 8.9 percent) is the next most popular method in this country. While one possible explanation for this popularity may be the relative lack of access to clinics and services, another equally important explanation may be found in the social and interpersonal difficulties involved in asking third parties for help with fertility control, in a setting where sexual activity must be acknowledged and intimate matters discussed with strangers.

Emerson, for example, describes the considerable poise and social skill that a woman must demonstrate if she is to play the role of gynecological patient without painful loss of dignity and self-esteem, and suggests that many less confident women try to avoid the situation.<sup>66</sup> Confidence in one's ability to manage interactions of this type will vary both with socioeconomic status and cultural background. An analysis of data on contraceptive use in Australia suggests that the use of rhythm and withdrawal, both strongly associated with low socioeconomic status and Southern European origin, may be partly explained in these terms.<sup>67</sup> That is, while these groups have had greater difficulty in gaining physical access to clinics and services, they may also experience (or anticipate) more subjective and interpersonal problems in managing a demanding and potentially humiliating interaction with service providers.

The hypothesis here is that people who feel that they lack the social skills to cope with an interaction with a

third party, in which their sexual activity must be acknowledged, will prefer a “private” method such as calendar rhythm or withdrawal that can be practiced without recourse to outside advisors. If this is also the case in social contexts other than Australia, we would not necessarily expect the popularity of self-taught calendar rhythm to indicate a demand for other periodic abstinence methods that, like the Billings method, require protracted interaction with third parties and considerable invasion of privacy.

Thus, despite heavy promotional efforts in the Third World, it is probable that few women will adopt the Billings method. This does not, however, mean that there is no cause for concern. Increasing resources are being devoted to promotion of this method in the developing countries, and in contexts where people have less access to a range of effective methods, decision making will be more constrained and women and their families will be more vulnerable.

For example, the Australian edition of Billings and Westmore's promotional book *The Billings Method* appears with a facsimile of a stamp of approval on the cover: It reads “97% effective—World Health Organisation.” A few pages within, the reader is told that the method “is as effective, properly used, as any other known method of fertility control. The scientific facts are indisputable.”<sup>68</sup> In fact, in September 1979, the Advisory Group to the World Health Organisation's Special Programme of Research, Development and Research Training in Human Reproduction “reviewed in depth the research on methods to determine the fertile period. It recognized that these two studies [the Colombia and WHO studies] had fulfilled a useful function in providing a scientific assessment of the OM and ST methods [the ovulation/Billings method and the symptothermal method]. It considered that these methods had very limited application, particularly in the developing countries, and recommended that the Programme devote no further research to measuring their effectiveness.”<sup>69</sup>

The international promotion of the Billings method retards efforts to meet the family planning gap indicated by the World Fertility Survey<sup>70</sup> and, depending as it does on the cooperation of male partners, may impede progress toward the emancipation of women in family systems where men are unlikely to give a high priority to the welfare and autonomy of their wives. The method's advocates claim that periodic abstinence enhances love and mutual respect, and this may be so in some instances. For many, however, periodic abstinence is a source of marital strain and, if no other back-up method is available, increases the vulnerability of women.<sup>71</sup>

It appears also that the Billings method is seldom offered simply as a natural alternative. Typically it is presented in a context of fear of the physiological and social dangers of more effective methods.<sup>72</sup> John Billings has been quite explicit about the undesirability of offering people a range of methods, deploring a “cafeteria” approach to contraception and insisting on the need to in-

sulate Billings method patients from the demoralizing opinions of those who are not dedicated to the method.<sup>73</sup> For him, the urgency of the population problem can never justify the use of "immoral" birth control solutions: Rather it should be seen as a test of faith.<sup>74</sup> This attitude necessarily creates problems for program administrators who might wish to offer the method as part of an integrated, comprehensive family planning program.<sup>75</sup>

The relative ineffectiveness of the method and the attitude of its promoters toward other methods are in themselves causes for concern. But this is not all. It cannot be claimed that the Billings method (or, for that matter, the sympto-thermal method) is necessarily a low-cost alternative and therefore especially suitable for the poor. While the costs are difficult to evaluate, it may even be that the reverse is the case,<sup>76</sup> particularly when the low use-effectiveness of the method is taken into account.

For example, Johnston et al. estimate that the per capita cost of a natural family planning user in 1976–1977 was \$34.82 (Australian), \$23.16 from federal funds and \$11.66 from community funds (church grants, subsidies, donations). The figures exclude any payment the user might make. In comparison, the New South Wales Family Planning Association, which offers a full range of methods, operated its clinics in 1976–1977 on a per capita user cost against federal funds of \$14.44.<sup>77</sup> Thus, despite the widespread use of voluntary lay teachers, natural methods were more expensive to provide than artificial methods. Johnston et al. go on to say that "Australian Natural Family Planning per capita client costs are high, but appear to be within the scale experienced by natural family planning programmes in other parts of the world (e.g. Mauritius US\$30 per acceptor)."<sup>78</sup>

Real costs will almost certainly vary according to local circumstances. In poorer countries, it may be necessary to offer some payment to teachers, and in at least one case, an Indian program, incentive payments are offered to users.<sup>79</sup> But whatever the local circumstances, teaching the Billings method is labor intensive. Clients require repeated contact over an extended period of time and, even if teachers do operate on a wholly voluntary basis, administrative costs can be high.<sup>80</sup> The teachers must be carefully taught and supervised, and, as the experience in Colombia, discussed earlier, has shown, a large staff may be necessary to recruit and train even a moderate number of users. In practice, the method is unlikely to be inexpensive.

The use of almost any birth control technique will prevent some unplanned pregnancies, and often, such nonappliance methods as withdrawal and abstinence may be all that is available, either in the objective sense of access to clinics and services or in the more subjective sense of psychological availability. It is also possible that some couples may prefer a periodic abstinence method. When, however, services and programs are being developed, there is reason to question the wisdom of actively promoting a relatively ineffective, high-cost method for which there is little demonstrable demand.

There is no one easy solution to the individual problem of unwanted fertility or to the global problem of the continuing pressure of population growth on natural resources.<sup>81</sup> It has not been the intention here to suggest that the Billings method, or other periodic abstinence methods, have no merit. On the contrary, where more effective methods are either unavailable or unacceptable, such nonappliance methods as simplified calendar rhythm and withdrawal may make a useful contribution to fertility control. The aim of this paper has been to draw attention to the fact that an objective examination of the scientific evidence for the Billings method often fails to support the claims that have been made for it, and that, given this, its active promotion raises some serious questions.

## References and Notes

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- 1 The method is variously described in the literature as the Billings method, the ovulation method, or the mucus method. The term *Billings method* is used in this paper, and, in the interests of clarity, terminology has been altered where the studies cited use other terminology but are clearly referring to the method developed by Drs. John and Evelyn Billings.
- 2 J.J. Billings, "An overview of the ovulation method," in J.N. Santamaria and J.J. Billings (eds.), *Human Love and Human Life* (Melbourne: Polding Press, 1979), p. 29.
- 3 J.J. Billings, "The contribution of family planning programmes," in J.N. Santamaria (ed.), *Man—How Will He Survive?* Papers from the conference on population and ecology held during the 40th International Eucharistic Congress, Melbourne, 1973 (Adelaide: Lutheran Publishing House, 1973), p. 87.
- 4 "New birth control method may yet beat poverty," *The Age*, Melbourne (July 11, 1974).
- 5 E.L. Billings and A. Westmore, *The Billings Method* (Melbourne: Anne O'Donovan, 1982), p. 13.
- 6 R. Lawler, "*Humanae Vitae*: Toward a richer and more human life," in Santamaria and Billings, cited in note 2, p. 151.
- 7 Billings, cited in note 2, p. 18.
- 8 Lawler, cited in note 6, p. 151.
- 9 Billings, cited in note 3, p. 88.
- 10 K. Betts, "The ovulation method of contraception," *Australian Journal of Social Issues* 11, no. 1 (February 1976): 1–14.
- 11 Betts, cited in note 10.
- 12 K. Hume, "The ovulation method—a wider view," *Australian Journal of Social Issues* 11, no. 1 (February 1976): 15–26.
- 13 Billings and Westmore, cited in note 5, p. 189.

- 14 The terms *natural* and *artificial* are used here, not because they reflect a real distinction, but because they have currency in the debate. In the mid-1970s the Australian government appointed a Royal Commission to inquire into aspects of human relationships and sexuality. The commissioners concluded that no method of contraception could truly be called natural and that this included the Billings method in that it required considerable instruction, diligence, and suppression of spontaneous sexuality. See E. Evatt, F. Arnott, and A. Deveson, *Royal Commission on Human Relationships*, Volume 3, (Canberra: Australian Government Publishing Service, 1977), p. 30.
- 15 J.A. Johnston, D.B. Roberts, and R.B. Spencer, *A Survey Evaluation of the Efficacy and Efficiency of Natural Family Planning Services and Methods in Australia—Report of a Research Project* (Sydney: St. Vincent's Hospital, 1978), pp. 19–22, and J.A. Johnston, D.B. Roberts, and R.B. Spencer, "A response to the Hilgers analysis," *International Review of Natural Family Planning* 3, no. 1 (Spring 1979): 206–213. The project was funded by a grant from the Australian Federal Department of Health. Although copies of the 436-page main report are not widely available, the authors have published their findings in the *International Review of Natural Family Planning* (Summer 1978: 143–154; Fall 1978: 203–224; Winter 1978: 328–353; Spring 1979: 20–53), and a summary of the findings has also appeared in *Family Planning Perspectives* 12, no. 4 (uly/August 1980): 214–215.
- 16 Evatt et al., cited in note 14, p. 29. See also Betts, cited in note 10.
- 17 Hume, cited in note 12.
- 18 Santamaria and Billings, cited in note 2.
- 19 Unpublished information supplied by Anne O'Donovan Publishing Company, Melbourne.
- 20 This quotation is from material provided by the Family of the Americas Foundation, Inc. (World Organization Ovulation Method—Billings, U.S.A., Covington, Louisiana).
- 21 C. P. Green, "International population assistance programs under attack," *Intercom* 10, no. 4 (April 1982): 3–4.
- 22 See pp. 36–37 in L.S. Liskin, "Periodic abstinence: How well do new approaches work?" *Population Reports*, series I, no. 3 (September 1981). In Australia, Johnston et al., cited in note 15, found that, while 87 percent of the women in the client sample of 1,724 were at least nominally Catholic, all the lay teachers sampled were practicing Catholics and 95 percent of them attended mass and the sacraments regularly. Although many teaching centers were located in private houses, the majority of clinics and some of the centers were located in premises operated and maintained by the Catholic Church, ranging from church halls to Catholic teaching hospitals (main report, pp. 42–43, 141, 120–121, 124).
- 23 S.C.M. Scrimshaw, "Women and the pill: From panacea to catalyst," *Family Planning Perspectives* 13, no. 6 (November/December 1981): 254–262.
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- 25 M.C. Weissman, L. Foliaki, E.L. Billings, and J.J. Billings, "A trial of the ovulation method of family planning in Tonga," *The Lancet* (October 14, 1972) 813–816; J.J. Billings, Correspondence, *The Lancet* (December 2, 1972): 1193–1194; J.J. Billings, Correspondence, *The Lancet* (January 2, 1973): 44; J.J. Billings, "Cervical mucus, the biological marker of fertility and infertility," *International Journal of Fertility* 26, no. 3 (1981): 182–195; J.J. Brennan and H. Klaus, "Terminology and core curricula in natural family planning," *Fertility and Sterility* 38, no. 1 (July 1982): 117–118.
- 26 Billings (1981), cited in note 25. See also Billings, cited in note 2, p. 16.
- 27 Billings and Westmore, cited in note 5, pp. 29, 36.
- 28 This comparative advantage could only be realized in longer cycles. In a 28-day cycle, where the menses last 5 days and ovulation occurs on day 15, with mucus symptoms beginning 6 days before, on day 9, according to the rules of the method 13 of the 28 days would be considered safe for intercourse. In short cycles or in cycles where mucus symptoms begin more than 6 days before the putative time of ovulation, the proportion of the cycle available for intercourse is less. See Billings and Westmore, cited in note 5, pp. 45–49, 81–88.

Johnston et al., cited in note 15, analyzed 1,000 menstrual cycles recorded by Billings method users. On the average, they showed 1.75 preovulatory "dry-days." The rules of the method state that only alternate preovulatory "dry-days" should be used for intercourse. In general, most of these couples would have experienced more restrictions than sympto-thermal method users relying on calendar rhythm to calculate preovulatory "safe" days. (In a 28-day cycle, the first 7 days would be considered "safe.") Longer cycles, moreover, were not, in this study, found to be associated with a longer sequence of preovulatory "dry-days" (main report, pp. 364–367, 247).
- 29 Johnston et al., cited in note 15 (main report, pp. 244, 269).
- 30 E.L. Billings, J.J. Billings, J.B. Brown, and H.G. Burger, "Symptoms and hormonal changes accompanying ovulation," *The Lancet* (February 5, 1972): 282–284.
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- 34 Johnston et al., cited in note 15.
- 35 Hume, cited in note 12.
- 36 Johnston et al., cited in note 15, (main report, p. 371). See also Johnston et al. (Spring 1979), cited in note 15, pp. 42–49.
- 37 Billings et al., cited in note 30.
- 38 Flynn and Lynch, cited in note 32.
- 39 Hilgers, Abraham, and Cavangh, cited in note 33.
- 40 Weissman et al., cited in note 25.
- 41 M.E. Wade, P. McCarthy, J.R. Abernathy, G.S. Harris, H.C. Danzer, and W.A. Uricchio, "A randomized prospective study of the use-effectiveness of two methods of natural family planning: An interim report," *American Journal of Obstetrics and Gynecology* 134, no. 6 (July 15, 1979): 628–631.

- 42 J.E. Medina, A. Cjuentes, J.E. Abernathy, S.M. Spieler, and M.E. Wade, "Comparative evaluation of two methods of natural family planning in Colombia," *American Journal of Obstetrics and Gynecology* 138, no. 8 (December 1980): 1142-1147.
- 43 World Health Organization, "A prospective multicentric trial of the ovulation method of natural family planning: 1. The teaching phase," *Fertility and Sterility* 36, no. 2 (August 1981): 152-158; World Health Organization, "A prospective multicentric trial of the ovulation method of natural family planning. II. The effectiveness phase," *Fertility and Sterility* 36, no. 5 (November 1981): 591-598.
- 44 See J. Marshall, Correspondence, *The Lancet* (November 11, 1972): 1027; R.W. Roach, Correspondence, *The Lancet* (November 11, 1972): 1027-1028; R.F. Vollman, Correspondence, *The Lancet* (November 18, 1972): 1085-1086; W.H. James, Correspondence, *The Lancet* (December 16, 1972): 1308.
- 45 Wade et al., cited in note 41.
- 46 Liskin, cited in note 22, p. 47.
- 47 Medina et al., cited in note 42.
- 48 Johnston et al., cited in note 15.
- 49 This part of the analysis excluded 326 couples who had not supplied all the information the researchers wanted, who had withdrawn from the study, or who had been lost to follow-up. It also excluded 196 former Melbourne Billings method couples who had provided retrospective but not prospective data, 63 sympto-thermal clients who had been taught by correspondence, and 7 couples who were discovered to have been using artificial methods. See Johnston et al., cited in note 15 (main report, pp. 31, 284). For further details about the sample, see pp. 270, 286 in the main report.
- 50 Johnston et al., cited in note 15 (main report, p. 290).
- 51 Johnston et al., cited in note 15 (main report, pp. 177-178).
- 52 Johnston et al., cited in note 15 (main report, pp. 193, 207).
- 53 Johnston et al., cited in note 15 (main report, p. 232).
- 54 T.W. Hilgers, "Analysis of an 'Australian NFP Survey,'" *International Review of Natural Family Planning* 3, no. 1 (Spring 1979): 54-87; (Summer 1979): 97-133.
- 55 J.A. Johnston, D.B. Roberts, and R.B. Spencer, "A response to the Hilgers analysis," *International Review of Natural Family Planning* 3, no. 3 (Fall 1979): 206-213.
- 56 World Health Organization, cited in note 43.
- 57 B. Vaughan, J. Trussel, J. Menken, and E.F. Jones, "Contraceptive failure among married women in the United States, 1970-1973," *Family Planning Perspectives* 9, no. 6 (November/December 1977): 251-258.
- 58 R.A. Hatcher, G.K. Stewart, F. Stewart, F. Guest, N. Josephs, and J. Dale, *Contraceptive Technology: 1982-1983*, eleventh revised edition (New York: Irvington), p. 5.
- 59 J.E. Laing, "Natural family planning in the Philippines," *Studies in Family Planning* 15, no. 2 (March/April 1984): 49-61.
- 60 Johnston et al., cited in note 15, (main report, pp. 169-171, 231).
- 61 Figures derived from Table 4 in R. Selwood and J. Leeton, "Factors influencing birth control habits in Victoria," *Australian Family Physician* 10 (February 1981): 96-101.
- 62 C.M. Young and H. Ware, "Contraceptive use in Australia," *Australian and New Zealand Journal of Obstetrics and Gynaecology* 19, no. 1 (February 1979): 1-6.
- 63 For a discussion of some of the continuing problems that people in Australia may experience in gaining adequate information about, and access to, effective methods, see K. Betts, "The availability of birth control: Victoria 1971-1975," *Australian Journal of Social Issues* 15, no. 1 (February 1980): 17-29.

Despite evidence of limited popular acceptance, natural methods continue to receive disproportionate government support in Australia. Between 1976/77 and 1981/82, the Australian Catholic Social Welfare Commission received from 19 to 21 percent of all federal money allocated for nonclinical family planning activities (i.e., education, information, and training). This was disbursed to natural family planning organizations. In 1981/82, the sum received was \$166,450 of a total of \$780,000 allocated for these activities. (Information supplied by the Department of Health, Canberra.)

At the state level, in Victoria, the Natural Family Planning Centre (Billings method) received a grant of \$19,285 in 1982/83, while the Family Planning Association of Victoria, which offers a range of effective methods, received \$25,000. Of some 90 weekly family planning clinic sessions offered through the state government's health commission in 1983, 6 were devoted to natural methods, and St. Vincent's Hospital, which is both a major public hospital and a teaching hospital affiliated with the University of Melbourne, continued to run a clinic that offered only the Billings method. (Information supplied by the Victorian Minister of Health.)

There are 112 Billings method centers in Australia. They rely on volunteer workers but are also supported by federal money, disbursed through the Australian Catholic Social Welfare Commission, as well as by grants from the various state governments. (Information supplied by the Family Life Centre, Melbourne.)

That John Billings was founding president of the Right to Life Association in Victoria and a coordinator of the vigorous and successful campaign against the 1973 Federal Abortion Bill symbolizes the link between the natural family planning lobby and the "pro-life" movement.
- 64 See Liskin, cited in note 22, pp. 51, 54, 63.
- 65 Laing, cited in note 59, p. 58.
- 66 J.P. Emerson, "Behavior in private places: Sustaining definitions of reality in gynaecological examinations" in H.P. Dreitzel (ed.) *Patterns of Communicative Behaviour* (New York: Macmillan, 1970).
- 67 K. Betts, "Wanted and unwanted fertility: Victoria 1971 to 1975," *Australian Journal of Social Issues* 15, no. 3 (August 1980): 194-208.
- 68 Billings and Westmore, cited in note 5, p. 13.
- 69 The report goes on to state that the advisory group "was very positive, however, to continuation of research on kits to determine the fertile period, which could be employed, not only for birth control, but also for the diagnosis and treatment of infertility." World Health Organization: Special Programme of Research, Development and Research Training in Human Reproduction, *Eighth Annual Report* (Geneva: World Health Organization, December 1979), p. 59.
- 70 R.S. Lightbourne, S. Singh, and C.P. Green, "The World Fertility Survey: Charting global childbearing," *Population Bulletin* 37, no. 1 (March 1982): 1-55.

71 See Liskin, cited in note 22, pp. 52–55, 58.

Sister Weissman's expanded account of the Tonga Trial indicates that an unspecified number of pregnancies resulted from "husband insistence." See Betts, cited in note 10, page 7. This phenomenon is not, of course, restricted to the Third World. The Australian Royal Commission on Human Relationships documents considerable violence by husbands toward wives in Australia, including sexual assault. See Evatt et al., cited in note 14, Volume 4, pp. 133–155.

72 P. Avedon, "Natural family planning: 'rhythm' redefined," *Intercom* 7, no. 10 (October 1979): 1, 4.

73 Billings, cited in note 3, pp. 78, 85.

74 Billings, cited in note 3, p. 79.

75 Liskin, cited in note 22, pp. 63–65.

76 Liskin, cited in note 22, pp. 62–63.

77 Johnston et al., cited in note 15 (main report, pp. 224–226).

78 Johnston et al., cited in note 15 (main report, p. 226).

79 Liskin, cited in note 22, p. 54.

80 Liskin, cited in note 22, pp. 61–62; Johnston et al., cited in note 15 (main report, p. 226).

81 L.R. Brown, "World food resources and population: The narrowing margin," *Population Bulletin* 36, no. 3 (September 1981): 1–43.