A Short History of Natural Family Planning

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Compiled for those interested in Natural Family Planning and its history
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There are two types of natural family planning, and we can find evidence of both types in the Old Testament. Obviously, natural family planning is not new. One type is based on awareness of female fertility; the other is a form of breastfeeding based on frequent suckling.

Part 1: Efforts and systems to determine the fertile time

Systematic natural family planning is based upon knowledge or estimates of the fertile time of the female fertility-menstrual cycle. Such knowledge is sometimes called "fertility awareness." The "method" of systematic NFP for *avoiding* pregnancy is chaste abstinence during the fertile time. Couples *seeking* pregnancy engage in the marriage act during the known fertile time. Such timing might be based on conscious fertility awareness or on religious directives or some combination of these.

The first hint we have of fertility awareness in biblical times is given in Genesis 19: 30-38. The Lord had destroyed Sodom and Gomorrah where Lot and his family had lived, and now they were living in a cave. The two daughters were desperate—how were they ever going to find a man and raise offspring? So they got their father, Lot, drunk and had relations with him, the older daughter one night and the younger the next. They both became pregnant. One son was named Moab, and he became the father of the Moabites; the other was named Benammi, and he became the father of the Ammonites. When the Jews returned to the land of Canaan after the Exodus, they encountered both tribes as enemies. In the mid-1970s, Dr. John Billings raised a question in one of his Collegeville lectures that is interesting from the perspective of fertility awareness: How did the daughters of Lot know they were fertile on those days?

The second hint of fertility awareness is found in the ritual purity laws of Leviticus 15:19-24 and 18:19. These are interpreted today as referring to abstinence during the five days of menses plus seven days ending with the ritual bath, the mikveh, on the evening of the 12th day. As a contemporary rabbi has written, "In a normal menstrual cycle, a woman is able to conceive in the middle of the cycle -- the 13th, 14th and 15th days of the 28-day cycle. It is virtually certain that after 12 days of sexual abstinence, such a couple will have intercourse on the very days when the woman is most likely to conceive." ("Following family purity laws enhances Jewish marriages" by Rabbi Wayne Dosick, www.JWeekly.com, November 8, 1996, accessed 10/20/2014.) Even if the Jews of Old Testament days did not have the conscious fertility awareness we have today, we can certainly regard these Levitical laws as part of God's plan to build up the children of Abraham. Call it the first form of systematic natural family planning.

The principle of periodic abstinence. A few decades after Thomas Malthus started the overpopulation scare in 1798, French observers began speculating whether the periodic fertility they noticed in farm animals might be duplicated in humans. Instead of asking their wives if they noticed anything special between one menses and the next, or looking at the Levitical texts noted above, they speculated that the time of menstruation and a few days thereafter might be the fertile time. This raised a moral question: would it be permissible for married couples to abstain during a time they thought was fertile in order to avoid pregnancy? The bishop of Amiens submitted a question (called a *dubium*) to the **Sacred Penitentiary** in Rome (the Vatican office that handles questions related to the Sacrament of Penance) asking about this. In **1853** Rome replied that such spouses were not to be disturbed "provided they do nothing by which conception is prevented." (John Noonan, *Contraception*, 1965, 439). This gradually became public, and when it was questioned in Spain, the question was again sent to Rome. In **1880** the Sacred Penitentiary not only reaffirmed its decision of 1853 but also said that a confessor might insinuate this permissive opinion to spouses "whom he has vainly tried with other reasons to lead from the detestable crime of onanism" (Noonan, 441). The Vatican did not make any judgment about the erroneous theory; that was beyond its competence. The Sacred Penitentiary

simply approved the moral principle of abstaining during the fertile time provided the spouses had good reason to do so.

Cervical mucus. In **1855**, just two years after the first Vatican response, **Dr. W. Tyler Smith**, a member of the Royal College of Physicians in London, described cervical mucus. "The use of the cervical mucus is probably twofold. In the first place, it closes the cervix uteri and defends the cavity of the fundus from external agencies as completely as though it were a shut sac." That would be during the infertile times. Dr. Smith then continued to describe this mucus during the fertile phase of the cycle. "In the second place, it appears to afford a suitable medium for the passage of the spermatozoa through the cervix uteri into the uterine cavity." (**Jan Mucharski**, *History of the Biologic Control of Human Fertility* with a Foreword by Edward F. Keefe, MD , FACOG, 1982, 90. This work is the source of most of what follows regarding the events up to the mid-20th century.) If Dr. Smith had been an Aristotle, he would have asked ***why*** and could have deduced that a woman was fertile for only a small part of her menstrual-fertility cycle. However, no such follow-up occurred, and the mucus symptom of fertility was forgotten for almost another 100 years.

The temperature pattern. Dr. Mary Putnam Jacobi is credited by Fr. Jan Mucharski (cited above) for being the first to notice that a woman's temperature has a cyclic pattern, rising for about two weeks before menses, falling during menses and remaining low until it began to rise again. Her paper, "The Question of Rest for Women during Menstruation," won the Boylston Prize at Harvard University in 1876 and was published in **1877**. For this study she had women record a number of physical items including their pulse rate and temperatures. Her paper showed that menstruation was not a sickness. She promoted the feminist causes of the day but failed to pursue the causes of the temperature cycle.

The theological significance of these two discoveries is that they show that well before the end of the 19th century God in his Providence had "revealed" the two most basic elements for determining the fertile and infertile times of the cycle—the 1855 discovery of cervical mucus as conducive to sperm migration and the 1877 discovery of the post-ovulation thermal shift.

Key developments in understanding the fertile time occurred soon after World War 1. In **1923-24**, a Japanese gynecologist, **Dr. Kyusaku Ogino**, published his research on ovulation, asserting that the duration of fertility was the day of ovulation plus the preceding three days, except when there was a rare case of more extended sperm life. **Dr. Hermann Knaus**, an Austrian obstetrician-gynecologist was performing similar studies during the 1920s and published his findings in 1929. Both physicians were interested in determining the fertile and infertile days of the cycle, and there was discussion between them. **In February 1930** Ogino published his work in a German medical journal, ("Ovulationstermin und Konzeptionstermin" *Zbl Gynaek* 54:464, 1930) and Knaus accepted Ogino's calculations as better than his own. **Dr. Jan Nicholas Joseph Smulders**, a Dutch neurologist, did so much work with the Ogino theory of periodic abstinence that Fr. Mucharski says that the system should have been called the Ogino-Smulders system instead of the Ogino-Knaus system. (In 1965 our landlords told us of their 100% success in the 1930s with the O-K system as they called it.)

The theological significance of this is that in February, 1930 there was a European publication of a system by which couples could estimate the fertile time with a good degree of accuracy and abstain during that time if they wanted to avoid pregnancy. In August 1930, the assembled bishops of the Church of England would offer only total abstinence or contraception as the alternatives—with no mention of this new and promising scientific work. I do not know if they were simply ignorant of this data or ignored it.

The Calendar Rhythm system. By 1932 the original calculations had been modified a bit. Some of the language is confusing because one calculation might yield the **last day** of pre-ovulation infertility (Phase 1) while another formula would state the **first day** of the fertile time (Phase 2) with exactly the same results. Here I am using the terms "the last day of Phase 1" and "the first day of Phase 3" (post-ovulation infertility). In those terms, the 1932 Ogino rule was this: *Shortest previous cycle minus 19 = the last day of Phase 1; Longest previous cycle minus 10 = first day of Phase 3* (in our terms above, Mucharski, 44).

Dr. Leo Latz coined the term "the rhythm method" and published a small book, *The Rhythm of Sterility and Fertility in Women* in 1932 to promote it to the American public. According to an online obituary in the *Baltimore Sun,* (May 4, 1994) the Archbishop of Chicago first approved and then disapproved his book. That soon passed, and Dr. Latz became *the* American name for the calendar rhythm method for over 30 years. In December 1936, the Fifth Revised Edition stated "150th Thousand."

He encountered opposition from a number of his fellow doctors who did not approve of his making this information available to the general public. They and some clergy feared that married couples might not have any children and that vice would be increased. This opinion was expressed in an interesting article in the second issue of *The Linacre Quarterly* (Ethicus, "The Morality of the Use of the Safe Period" 1:2, March 1933, 23-26. "Ethicus" is the pen name of one or two writers who chose to remain anonymous. The article is interesting far beyond the few sentences devoted to expressing this opposition.) The well-intentioned opposition was so strong that Dr. Latz was dismissed from the faculty of the Loyola University School of Medicine. In his *Rhythm* book, he devotes Part 3, Ethical Aspects (103-136) to answer these objections. First, he quotes Pope Pius XI: "Nor are those considered as acting against nature who in their married life use their right in the proper manner, although on account of natural reason of time or of certain defects, new life cannot be brought forth." [*Casti Connubii,* para. 59] Dr. Latz also quoted a number of theologians in his defense. This quotation from Bishop John F. Noll well summed up his case: "If there be…a law of nature according to which they (parents) may attain their end and purpose (spacing children) without sin, they are certainly entitled to know of that law" (129, parentheses in original).

Dr. Latz took very seriously his obligation to help married couples live according to the teaching of the Church, even traveling to Europe to study under Dr. Knaus before writing his book. His explanation of Calendar Rhythm was more complex than the simple Ogino formula quoted above since he sought to make it adaptable to a wide range of situations. He reportedly never accepted the use of

the mucus and temperature signs and died in 1994 at the age of 91 still convinced that calendar rhythm was sufficient.

The Ogino rule given above would be further modified by others based on wide experience. Thus **Dr. Konald A. Prem** in 1968 would use a 19-day rule for women with regular cycles and a 21-day rule for women with irregular cycles. He later used only the 21-day rule and dropped the 19-day rule completely because of a few surprise pregnancies with it.

A recent form of calendar rhythm called the **Standard Days Method®** (SDM) was developed by the Institute for Reproductive Health (IRH) at Georgetown University in the late 1990s for simplicity of use in undeveloped countries. It is claimed to be 95% effective when used correctly. According to the IRH website, SDM works for women with menstrual cycles from 26 to32 days long. To use the method, couples abstain from sexual intercourse on days 8 through 19 of the woman's menstrual cycle. However, "If a woman has more than one cycle per year that is shorter than 26 days, or longer than 32 days, the method effectiveness decreases significantly and a different method of NFP should be used." The SDM also has special rules for postpartum mothers after her first period.

The Calendar-Temperature system. In **1926** Dutch gynecologist **Theodore Hendrik van de Velde** recognized that the rise in temperature was caused by ovulation and the corpus luteum. Based on his own research he asserted, with some reservations, that the rupture of the follicle (ovulation) occurred on the 11^{th}, 12^{th}, or 13^{th} day of the cycle, always with the possibility of an earlier or later ovulation.

In **1935**, **Father Wilhelm Hillebrand**, a German Catholic priest who simply wanted to help couples who had real needs to avoid pregnancy, used the temperature sign to crosscheck the calendar calculations for the start of Phase 3. He had first advised women about the Ogino and Knaus systems, but three unplanned pregnancies led him to look for something better. From his brother, a doctor, or from his own reading, he became aware of the van de Velde research of 1926, so he collected temperature graphs from 21 women in 1935 and compared them

with the calendar calculations. "A clear-cut, new combined calculo-thermal approach of controlling human fertility had been born" (Mucharski ,75). He devoted the next 24 years of his life to promoting this system. Eleven days before he died in 1959, the Albertus Magnus University in Cologne awarded him an honorary doctorate in medicine. A fascinating biographical sketch of Father Wilhelm and his research was written by Dr. R. F. Vollman, (see below) and is available at http://www.usccb.org/issues-and-action/marriage-and-family/natural-family-planning/resources/upload/intl-review-nfp-1979-vollman-pathfinders-2.pdf. Sketches of other NFP pioneers are also available at http://www.usccb.org/issues-and-action/marriage-and-family/natural-family-planning/resources/history.cfm . (Accessed 2/19/2016)

Beginning with **Dr. Rudolph F. Vollman** of Switzerland, this history is about people who were well known in the international NFP movement in the 1970s. Dr. Vollman used a 20-day rule for determining the last day of Phase 1 (shortest cycle minus 20 = last day of Phase 1). For the start of Phase 3, he advised three consecutive days of high temperatures. He also recommended the observation of intermenstrual pain termed *mittelschmerz,* and the observation of mid-cycle cervical mucus for two or three days. He was a regular speaker at the NFP symposia hosted by **Father Paul Marx, OSB**, at St. John's University in Collegeville, Minnesota through the 1970s. His book, *The Menstrual Cycle: Major Problems in Obstetrics and Gynecology* (Saunders, 1977) was well respected. A letter I once found on the internet shows that he was the head of the Section on Obstetrics Perinatal Research Branch at the National Institutes for Health in Bethesda, MD in early 1967.

Dr. Edward F. Keefe, a New York City obstetrician-gynecologist, was an early promoter of the temperature sign among his patients, and in **1948** he designed and manufactured a special thermometer called the **Ovulindex** for improved accuracy with temperature recordings. This highly accurate thermometer recorded temperatures only from 96 to 100 degrees Fahrenheit with a very readable scale, and it came with good instructions on the temperature system. **In 1953 he added mucus observations** to the booklet, suggesting that women obtain their cervical mucus directly at the cervix, just as he would do in a

gynecological examination. Thus was born the **internal observation** of cervical mucus. His ***patients*** then instructed ***him*** that the cervix was low and firm with a closed opening (the **os**, the Latin word for mouth) during the infertile times of the cycle and high, soft and with an open os when the cervical mucus was present and abundant. He pursued this and published his findings as **"Self-observation of the cervix to distinguish days of possible fertility"** in the *Bulletin of the Sloane Hospital for Women,* (8:129, 1962), complete with photographs. Dr. Keefe was also a regular speaker at the Collegeville summer gatherings of the early NFP movement.

In 1953 **Dr. John Billings** began his work in natural family planning in Australia. At first he taught both the mucus and temperature signs and then focused entirely on the mucus sign. His wife, **Dr. Evelyn "Lyn" Billings** became involved in 1963. In 1964 they published *The Ovulation Method* that taught both signs. By 1971 they published again, this time dropping the temperature sign and focusing solely on the mucus sign of fertility. This is understandable, given their efforts to spread this knowledge in parts of the world where it would be difficult to obtain thermometers, but the Drs. Billings also promoted the single-sign system in the developed countries as well. Dr. John was a regular speaker at the Collegeville seminars, and one summer the current writer recalls him giving another reason for not teaching the temperature sign. According to Dr. John Billings, the temperature is so easy to take and record that women become careless or omit their mucus observations. Thus was born one of the great divisions in the NFP movement since others believe that the answer to the problem mentioned by Dr. Billings is better education about the importance of both signs. Also, many think that couples should know *both* signs and therefore have the freedom to choose for themselves what fertility sign or signs they want to use.

In 1957 **Dr. Jan Gerhard Hendrik Holt**, a Polish obstetrician, wrote a book on the calendar-temperature system. He used a 19-day rule to set the end of Phase 1 and called for three days of sustained high temperatures to determine the start of Phase 3. He also used a card with two windows that could be placed over the temperature graph. The lower window was to be placed over the pre-shift temperatures, and the upper window would show the elevated temperatures. He

told couples to look for three temperatures above the previous six. The card with the windows was a visual aid for seeing the "three above the previous six," a process incorporated into contemporary Sympto-Thermal systems but without the card.

In 1963 **Dr. John Marshall**, a professor of clinical neurology at London University, published his useful book titled *The Infertile Period: Principles and Practices* (Helicon Press, Baltimore). He advised against relying on calendar-rhythm calculations and insisted that temperature recordings should be used when there was a need to know the fertile time, whether for achieving or avoiding pregnancy. He is notable for distinguishing between three types of upward temperature shifts. With an acute rise, Phase 3 would start on the evening of the third day of high temperatures. In a slow rise, which he illustrated, he called for waiting until the fifth day of slowly rising temps. He applied the same 5-day rule to a step-like rise. Dr. Marshall did not accept the value of the mucus sign as it was promoted during the early Seventies. He saw the value of the temperatures as an improvement on the calendar calculations for the start of Phase 3, but would not recognize the value of the mucus sign as part of a combined system. As mentioned above, the other side of the coin is that Dr. John Billings, also a neurologist, was so enthusiastic about cervical mucus as a fertility sign that he completely dropped the temperature sign and even spoke against its use.

Dr Gerhard. K. Doering published an excellent **temperature-only** study in a German Medical Journal on June 9, 1967, just a little more than 13 months before the publication of *Humanae Vitae.* He found that among those who restricted their marriage acts to Phase 3 (post-ovulation infertility) there were no perfect-use pregnancies and an imperfect use rate 99.2% (0.8 per 100 woman-years). Among those who used his system for Phase 1 as well as Phase 3, he reported a total pregnancy rate 96.9%--or 3.1 per 100 woman years. Here is his own commentary:

"[Combined form:] Of them there were 689 women who made use of the combined form of the temperature method during 48,214 cycles, that is, they used the post-menstrual phase as well as the pre-menstrual infertile phase. In the period of observation there were 125 unintended pregnancies. [Of these, only 13

were perfect-use end-of-Phase-1 pregnancies. All others were imperfect-use pregnancies of which 56 were from marriage acts clearly in the fertile time. See Table 1.] According to the Pearl Formula, this shows a failure rate of 3.1 per 100 woman-years of application." An English translation of his study is at http://nfpandmore.org/Doering-1967-100315.pdf

The Sympto-Thermal Method. This system to determine the fertile and infertile times of the fertility-menstrual cycle uses previous cycle history plus all the common signs of fertility and infertility—mucus, temperature changes, and cervix changes, with occasional references to *mittelschmerz*, a pain in the ovarian area associated with ovulation.

Dr. Konald A. Prem, a professor of obstetrics and gynecology at the University of Minnesota Medical School, was the American developer of the Sympto-Thermal Method (STM) in the Sixties or late Fifties, while **Dr. Jozef Roetzer** developed and promoted this system in Austria.

Doctor Prem also had an abiding interest in **ecological breastfeeding**, and it was this interest that brought about the first meeting between Dr. Prem and **John and Sheila Kippley.** Both Dr. Prem and Mrs. Kippley were scheduled to speak at the July 1971 conference of La Leche League in Chicago, so they met in June at his university office to discuss their subjects. Dr. Prem had lectured widely in Twin City parishes about NFP and had previously published an article on the STM ("Temperature Method in the Practice of Rhythm," *Proceedings of the Second International Symposium on Rhythm,* Kansas City, December, 1965; reprinted in *Child and Family,* Fall, 1968). The title of the article may be misleading; it also includes cervical mucus and *mittelschmerz* plus a section titled "Superiority over 'calendar' rhythm." He also researched breastfeeding and natural baby spacing. The fact that the *second* International Symposium was held in 1965 indicates that a number of Catholic doctors in the early Sixties were taking seriously their obligation to help married couples learn how to practice natural family planning.

It was at this June meeting that Dr. Prem enthusiastically agreed to work with the Kippleys to build a network of trained user-couples to teach the STM and ecological breastfeeding wherever they were welcome. Dr. Prem and the

Kippleys taught their first four-meeting course in the fall of 1971 at St. Odilia's parish in Shoreview, a suburb north of St. Paul. He habitually assured couples that if they experienced a surprise pregnancy while using the rules he taught, he would deliver the baby without charging for his professional services. He told the Kippleys that he never had any couple take him up on that.

The significance of Prem's experience and expertise deserves attention. As contrasted with the above mentioned neurologists who promoted the temperature-only and the mucus-only systems, his expertise was obstetrics and gynecology, and he was open-minded, not dedicated exclusively to either the temperature sign or the mucus sign or the cervix sign. He was also open to modification. For example, he had been advising that Phase 3 began on the *morning of the 4th day* of elevated temperatures, but in order to achieve unity with the rest of the NFP movement, he was willing to accept the common European rule that Phase 3 began on the *evening of the 3rd day* of elevated temperatures. While some might add the mucus-only requirement of *always* waiting until the evening of the 4th day of drying-up past the Peak Day plus three days of high temperatures, he recognized that this would not be necessary in the presence of a high thermal shift of three days. In fact, in a rule named after him in some STM systems, Rule K (for Konald) , he taught that only two days of drying-up (Peak day plus 2) were required to crosscheck three days of full thermal shift. When it was proposed that couples should be taught to use the three-day temperature-only rule of Dr. G. K. Doering, he insisted that *in a cross-checking system*, at least two days of drying up should be required to crosscheck the temperature shift to ensure that the shift was not caused by something extraneous such as a cold or a mild fever.

In 1976 **Dr. Thomas W. Hilgers** began to develop his modified version of the Billings Ovulation Method, and in 1985 he founded the Pope Paul VI Institute to promote and teach his system. While the Billings system focuses on sensations at the vulva, the Hilgers system emphasizes the evaluation of mucus obtained with toilet tissue. He also added a way of evaluating the daily observations with a series of letters and numbers. He calls his system the Creighton Model which is taught in his Fertility*Care*™ program. Dr. Hilgers also developed what he calls

NaProTechnology® to provide medical and surgical care for women who have serious cases of infertility.

The most controversial aspect of the Creighton Model and Fertility*Care*™ is his method of calculating user-effectiveness statistics. His pregnancy-analysis system is different from that used by the other NFP systems, and that makes his user-effectiveness rates appear significantly higher than they would be if he used the analytical system used by the other NFP systems. See Joanne Doud below.

A simplified mucus-only system called the **TwoDay Method** was developed by Institute for Reproductive Health at Georgetown University. According to the IRH website, a woman using the TwoDay Method checks for cervical secretions at least twice a day. "If she notices secretions of any type, color, or consistency either 'today' or 'yesterday,' she considers herself fertile. A woman can use a simple card to help her keep track of the days she has secretions." The IRH website states that the system can be used with a 96% effectiveness rate when used properly. A key phrase in that description is "of any type, color or consistency." When days of merely tacky mucus follow days of more stretchy type mucus, most systems would count those tacky-mucus days as part of a drying-up process; the TwoDay Method would not.

The most recently published system of natural family planning was developed by **Richard Fehring**, PhD, RN, professor of nursing at Marquette University. Called the **Marquette Model** (MM), its website states that it uses the ClearBlue Easy Fertility Monitor, a device used at home which measures hormone levels in urine to estimate the beginning and end of the fertile time in a women's menstrual cycle. The information from the monitor can be used in conjunction with observations of cervical mucus, basal body temperature, or other biological indicators of fertility. The MM was developed by nurses and physicians at Marquette University in the late 1990s. A 2007 study found a 97.9% perfect-use efficacy of the MM in avoiding pregnancy when taught by a qualified teacher and correctly applied, and an imperfect-use efficacy of 85.5%. (Fehring, R**.,** Schneider, M., & Raviele, K.,2007, "Efficacy of hormonal fertility monitoring as a method of natural family planning," *Journal of Obstetric, Gynecologic & Neonatal Nursing,* 36(2), 152-160.) The MM website does not state the cost of the monitor and the

test strips, but a 2013 study by Fehring et al says that the monitor is available in major drug stores for $150 to $200, and a box of 30 test strips costs from $30 to $50, with each cycle requiring the use of about 10 strips. (*Contraception,* 88: 2013, 25).

Effectiveness of different systems. Shortly after the publication of ***Humanae Vitae***, the Catholic bishops of the United States founded and funded the **Human Life Foundation** and appointed **Lawrence J. Kane** as its executive director. He soon realized that people in the fields of government and medicine knew little about natural family planning, and he also realized that there was considerable conflict between the promoters of the **Billings Ovulation Method** and the **Sympto-Thermal Method**. He persuaded the National Institutes of Health (**NIH**) to conduct an unbiased study of the claims put forward by the respective advocates. The prospective randomized study, sometimes referred to as the Los Angeles study, was conducted at the Cedars of Lebanon Hospital in Los Angeles to compare the relative use-effectiveness of the two systems in 1976-1978. Each couple recruited to enter the study was *assigned* at random to one system or the other; they could not *choose* one or the other. The investigators thought they would need a large sample and several years of study to determine whatever differences there might be. In actuality, the results became so apparent that they terminated the study early. That is, as professionals they could not pretend that they did not know which system had a higher or lower use-effectiveness rate.

The final report was published in the *American Journal of Obstetrics and Gynecology* (141:4, October 15, 1981, 368-376). A preliminary report had been published in 1979. Both Dr. Billings and Dr. Hilgers criticized that first report; in fact, both of them had been involved as consultants to the study. The investigators responded but did not change their conclusions.

> "The final results of a prospective comparative study of two methods of natural family planning indicate a significant difference in the 12-month net cumulative pregnancy rates between the ovulation and symptothermal methods. These differences are on the order of two to one in favor of the symptothermal method"(368).

> "Measured from the beginning of entry into the formal study phase, the Pearl pregnancy rates were 39.7 for OM and 13.7 for STM [per 100 woman-years]" (374).
> "During the study phase, 62 pregnancies occurred (42 OM and 20 STM). There were 36 user failures and six method failures in the OM group during the study phase. There were no method failures in the STM group" (374). "Results of this study show the STM to be superior to the OM of NFP in terms of use effectiveness" (375).

Also significant is a sentence on the final page of the report.

> "It is of interest that after couples were informed in August, 1978, that a statistically significant trend in the pregnancy rates between the OM and STM groups had been found, almost all of the STM volunteers continued in training and virtually all of the OM volunteers requested to be, and were, thoroughly trained in STM" (376).

Another helpful study of the **Sympto-Thermal Method** was conducted in Germany for a number of years and published in 2007. (**Petra Frank-Herrmann**, J. Heil, C. Gnoth, E. Toledo, S. Baur, C. Pyper, E. Jenetzky, T. Strowitzki and G. Freundl, "The effectiveness of a fertility awareness based method to avoid pregnancy in relation to a couple's sexual behavior during the fertile time: a prospective longitudinal study," *Human Reproduction,* 22:5, 2007, 1310-1319). What makes this study unusual and perhaps unique is that couples were asked to record whether they were using chaste NFP or were using barrier methods or other contraceptive behaviors during the fertile time. Couples using chaste abstinence achieved a **perfect-use effectiveness** rate of 99.6%. "We have demonstrated that… couples abstaining from intercourse during fertile time [had a] 0.4% pregnancy rate per year. We found similar pregnancy rates for couples who occasionally use barrier methods, mainly condoms, during the fertile time as compared to couples who were abstinent" (1315-13-16). While the rate was similar it was not identical; that's why the abstract states: "the pregnancy rate was 0.6 per 100 woman and per 13 cycles when there was no unprotected intercourse in the fertile time" (Background, 1310). That is, they had a rate of 99.4% rather than 99.6%. "The use-effectiveness of the method, i.e., **the overall pregnancy rate**, was 1.8% after 13 cycles of use and the discontinuation rate due to dissatisfaction with the STM was only 9.2% per 100 women after 13 cycles…"

(1318). That 1.8% rate reflected 22 pregnancies. Of those, 16 occurred from the marriage act during the fertile time (1314).

Continued disagreement regarding effectiveness. During the Seventies and the Eighties, the *International Review of Natural Family Planning* provided a forum for information and discussion relevant to natural family planning. The Spring 1985 issue carried an article titled "Use-Effectiveness of the Creighton Model of NFP" by **Joanne Doud**, B.S.N., CNFPP, CNFPE, a Creighton Model NFP practitioner and educator in Wichita, KS. In the abstract she stated, "The use-effectiveness of the method as a means to avoid pregnancy was 97.3 at the 6th ordinal month and 96.2 at the 12th ordinal month" (54). The author also listed 68 pregnancies as "unplanned." I replied in the Winter 1985 issue and applied the Pearl formula used by the rest of the NFP movement. This standard way of doing statistics yielded a use-effectiveness rate of 67%, a far cry from the 96.2% claimed by Mrs. Doud. That's in the same range as the 60.3% use-effectiveness found in the Los Angeles study cited above.

This difference continues to the present time. In the rest of the NFP movement, pregnancies that result from not following the rules are used to calculate the use-effectiveness; that's what distinguishes imperfect-use effectiveness from perfect-use effectiveness. ("Imperfect use" is frequently called "typical use.") There is, however, no way to judge the typical-use effectiveness of the Creighton Model unless the number of pregnancies that are considered unplanned by the user-couples are included. Fortunately, Mrs. Doud published that data.

Professor Richard Fehring has pursued this issue. He headed up a study published in 2009 that compared the MM (Marquette Model: cervical mucus cross-checked by hormonal monitor) to a cervical mucus monitoring system. i.e., mucus-only, (CMM). Regarding perfect-use effectiveness, the MM group had a rate of 98% and the CMM had a rate of 97.2%. Regarding typical-use effectiveness that includes imperfect-use pregnancies, the study found that the cross-checking system had a significantly higher user-effectiveness rate, an 88.7% rate with the monitor and a 77.2% rate with mucus-only (Fehring, R., Schneider, M., Barron, M.L., & Raviele, K. "Cohort comparison of two fertility awareness methods of family planning," *Journal of Reproductive Medicine,* 54:3, March 2009, 165-170.)

The mucus-only users were instructed by experienced teachers using the Hilgers' Creighton Model.

Fehring headed up **another comparative study** published in 2013 (Richard J. Fehring, Mary Schneider, Kathleen Raviele, Dana Rodriguez, and Jessica Pruszynski, "Randomized comparison of two Internet-supported fertility-awareness-based method of family planning," *Contraception* 88 (2013) 24-30). (Randomization was also used in the Los Angeles study cited above.) In this study, the Electronic Hormonal Fertility Method (EHFM) also used "a calendar-based formula as a double check for the beginning and end of the fertile phase" (24). The other side of the study was a Cervical Mucus Method (CMM, mucus-only) developed by the Marquette researchers. Over 12 months, "There were no significant differences between the two groups in *perfect use* pregnancy rates" (27, italics in original). The EHFM group had zero (0) pregnancies for a 100% effectiveness rate, and the CMM group had a rate of 2.7 per 100 woman-years for an effectiveness rate of 97.3%, and this was not considered statistically significant. With regard to the total unintended pregnancy rate, the groups "were significantly different" (27). In the EHFM group, the rate per 100 women was 6.8; in the CMM group, the rate was 18.5. Everything considered, the biostatistician concluded: "The rate of pregnancy in the mucus group is 2.96 times that of the monitor group" (27).

Part 2: Breastfeeding and delayed fertility

For centuries, breastfeeding was an unconscious and natural way of spacing babies. Our first mother, Eve, and all of her descendants for many generations breastfed their babies simply because there was no other easy alternative. When and if there were efforts to substitute the milk of other mammals, they would have been short-lived because babies either died or did not thrive under such conditions. It is safe to assume that they would have nursed their babies as was still done in the 20th century (and perhaps even at this writing) by some primitive hunter-gatherer tribes. That is, they would keep their babies with them and let the babies nurse whenever they desired.

Breastfeeding and natural spacing would have been taken for granted in Old Testament times and thus not deemed worthy of mention by the Sacred Authors, but there are still a few direct statements about long-term nursing. Samuel was old enough to be left with the prophet Eli when he was weaned (1 Sam 1:21-28), and certainly Eli would not have been in the business of baby care. The mother of the Maccabees specifically tells her son that she had nursed him for three years (2 Mac 7:27). Biblical commentators generally say that weaning occurred at ages three and four in Old Testament times. For more on this see "Scriptural Mothering" at http://nfpandmore.org/bfscriptural.shtml .

The history of breastfeeding and fertility awareness in the post-apostolic era is not clear. The ordinary thing would have been for mothers to nurse their babies for a fairly long time because experience shows that babies do not thrive on other milks. Fr. William Virtue has written how theologians criticized the ladies of the court during late medieval and renaissance times for not breastfeeding their own babies. He notes that they had a serious obligation to breastfeed because if they used the milk from cows or other animals, the babies at best would not thrive and frequently they would die. Also, the wealthy women would employ wet nurses for their babies. The huge moral problem with that is that young girls would become pregnant out of wedlock in order to have a baby and bountiful milk; secondly, some wet nurses would give priority to the income-producing baby to the neglect of their own. (William D. Virtue, PhD., *Mother and Infant: The Moral Theology of Embodied Self-Giving in Motherhood in Light of the Exemplary Couplet Mary and Jesus Christ,* dissertation, Pontifical University of St. Thomas, Rome, 1995.)

More recent developments. In 1956, seven Catholic mothers in the Chicago area founded an organization to revive breastfeeding in the United States and the rest of the developed world. They titled it **La Leche League** (LLL) in honor of a statue and shrine in St. Augustine, Florida (USA) honoring "Nuestra Senora de la Leche y Buen Parto," which is commonly translated as "Our Lady of Happy Delivery and Plentiful Milk," even though a literal translation would be "Our Lady of Milk and Good Birth." The League teaches the many benefits of breastfeeding including natural baby spacing, and Sheila Kippley started to attend their meetings during

her first pregnancy and eventually became a certified LLL leader. The League taught that "total breastfeeding" was associated with delayed fertility, but various mothers experienced widely different lengths of breastfeeding amenorrhea with "total breastfeeding." (Amenorrhea is the absence of menstruation.) In their discussions, one of the LLL mothers asked Sheila to research this situation. She did so, and that research can be accessed at http://nfpandmore.org/reviewbreastfeeding.shtml .

Two papers of historic interest are published at the website of NFP International, www.nfpandmore.org. **Dr. Leonard Remfry** in 1895 found that only six percent of breastfeeding mothers conceived before they experienced a first period, regardless of the duration of amenorrhea (http://nfpandmore.org/remfrys_article_1895.pdf).

Dr. Konald A. Prem, in his study of breastfeeding mothers, reported a similar result—six conceptions prior to a first period with the last one occurring at 118 weeks postpartum. "This is a record of six pregnancies among 118 nursing mothers—only 5%, only 1% less than that reported by Remfry in 1895." (http://nfpandmore.org/Postpartum_ovulation_prem.pdf).

Based on research published in the 20th century, Sheila Kippley wrote *Breastfeeding and Natural Child Spacing* that she self-published in 1969. This included a survey, and the results of that survey were published in the *Journal of Obstetric, Gynecologic, and Neonatal Nursing,* Nov-Dec 1972, http://nfpandmore.org/relationbreastfeeding.shtml. The primary finding was that mothers doing ecological breastfeeding experienced, on average, 14.6 months of breastfeeding amenorrhea with a range from 1 to 30 months. Seven percent of mothers (2 cases) experienced a first menses in the first six months, but their temperature charts indicated that ovulation did not occur for several more months. (A first bleeding episode was very conservatively counted as a first menstrual period.) At 18 months, 33 percent were still in amenorrhea. A larger study was published in the *International Review of Natural Family Planning* (Spring-Summer, 1989) and it found an average of 14.5 months of breastfeeding amenorrhea http://nfpandmore.org/spacingbabies.shtml . In 1974, Harper and

Row published a revised hard cover edition of her work titled *Breast-Feeding and Natural Child Spacing: The Ecology of Natural Mothering.*

The term **Ecological Breastfeeding** (EBF) first appeared in the 1972 preliminary edition of *The Art of Natural Family Planning* by the Kippleys. The maternal behaviors now called the **Seven Standards of Ecological Breastfeeding** were included in the natural mothering /natural child spacing program that was described in the original self-published (mimeographed) 1969 edition of *Breastfeeding and Natural Child Spacing.* It was also implicitly included by the questions in the breastfeeding survey that was added to additional printings of that edition.

The effect of breastfeeding on population was noted by **Dr. Otto Schaefer** who spent 32 years serving the health and medical needs of the Inuit (or Eskimo) people in Canada. The Inuit mothers traditionally breastfed their children for three years and had a completed family size of 3 to 4 children, but in the years after WWII they were influenced by outside factors to adopt bottlefeeding and thus lost the natural spacing of breastfeeding. Their birth rate went "from less than 40 births per 1000 in the mid-1950s to 64 births per 1000 ten years later" (Otto Schaefer, "When the Eskimo Comes to Town," *Nutrition Today,* November-December 1971, 16). He saw that 60% increase directly related "to the mileage of the family from the trading posts. The shorter the distance [to the trading post] the more frequently they had children" (ibid). His opinion: "There is a clear relationship between the increasing use of bottlefeeding and the shortening of lactation. This important point is usually overlooked in searches for explanations of the population explosion seen in developing countries" (ibid).

Schaefer and **Dr. Jack Hildes** presented their research at the Circumpolar Health Symposium in Finland (Oulu, Finland, June 1971; Unpublished; acquired through O. Schaefer). They compared the conception intervals of older Eskimo mothers who had nursed traditionally to the younger women who bottlefed. Women aged 30-50 in most cases reared children in the tradition of camp life with prolonged breastfeeding as the major source of infant nutrition until native foods such as seal meat or caribou were taken. Younger women aged 17-29 in the course of urbanization used bottlefeeding at the expense of prolonged breastfeeding. The

older women conceived 20 to 30 months postpartum while the younger women who used baby bottles and formula conceived 2 to 4 months postpartum.

Two 1980's studies of frequent breastfeeding reported **birth intervals of 44 months** with no contraception. The first study involved **the !Kung people** in Africa. (Konnor, M. and Worthman, C., "Nursing Frequency, Gonadal Function and Birth-Spacing and !Kung Hunter Gatherers," *Science*, Feb 15, 1980). In the second study, **the Gainj people** in New Guinea had a birth interval average of 44 months and an average completed family size of 4.3 children. (Wood, J. et al., *Journal of Biosocial Science, Supplement ,* 9, 1985, 159). In a third study, 72 American women with frequent nursing averaged 14 months of postpartum infertility (Taylor,W., Smith, R., and Samuels, S., "Postpartum Anovulation in Nursing Mothers," *Journal of Tropical Pediatrics,* December 1991, 286-292). See also S. Kippley, *The Seven Standards of Ecological Breastfeeding: The Frequency Factor* (2008, 46-47).

The **Lactational Amenorrhea Method.** Lactational amenorrhea is a synonym for breastfeeding amenorrhea. A number of researchers met at Bellagio, Italy in 1988 and published the **Bellagio Consensus.** ("Consensus Statement: Breastfeeding as a Family Planning Method," *The Lancet*, November 18, 1988, 1204-5). They reported that the first six months of lactational amenorrhea were 98% infertile provided that the mothers followed three standards: 1) Exclusive breastfeeding — the baby consumes nothing but mother's milk suckled directly from the breast; 2) The baby was not yet six months old; 3) The mother was still in amenorrhea. They also stated that any bleeding episode in the first eight weeks could be ignored and not counted as a first menstruation. Interestingly, the studies they cited showed a first-six-months 99% infertility rate, but the Consensus report conservatively stated at least a 98% rate. The LAM can be very helpful for some mothers who want to breastfeed for only six months. However, the lack of a frequency-of-suckling standard results in earlier returns for many mothers. The result is that only 56% of mothers following the LAM standards will be in amenorrhea at six months. Among mothers doing EBF, 93% will be in amenorrhea at six months. It is both interesting and hopeful that leaders promoting the LAM now advocate additional standards that bring it closer to the

seven standards of ecological breastfeeding. See "Comparison of Ecological Breastfeeding with Lactational Amenorrhea Method" at http://nfpandmore.org/nfpcomparision.shtml .

The most recent research concerning Ecological Breastfeeding was conducted by **H. William Taylor**, Jr. PhD. First, he completed his doctoral dissertation in Biomedical Engineering (U of California, Davis) in 1989 titled, "Effect on Nursing Pattern on Postpartum Anovulatory Interval." He and his wife were a Kippley-trained NFP teaching couple and were well acquainted with the practice of Ecological Breastfeeding. What Dr. Taylor did was to give Ecological Breastfeeding more scientific support with life table analysis and other statistical analyses worthy of a doctoral dissertation. One of his principal findings was that the median return of ovulation was 12.8 months postpartum with a range from 5 months to 27 months. He stressed the importance of short intervals between nursing episodes.

Dr. Taylor then joined with other researchers for several more studies dated 1991, 1995, 1999, 2003 and 2004, some of which were international comparative studies. At some future date these will be described in Breastfeeding Infertility Research at www.nfpandmore.org. For the present, we can say that these studies plus Dr. Taylor's personal comments to us indicate that mothers who follow the Seven Standards of Ecological Breastfeeding with short intervals between feedings will experience essentially the same results that we have reported in our studies.

What were called "guidelines" in her earlier work and in her cited studies are called the Seven ***Standards*** of Ecological Breastfeeding in more recent years. In response to questions about the science behind these Standards, Mrs. Kippley researched and wrote *The Seven Standards of Ecological Breastfeeding: The Frequency Factor* (Lulu Press, 2008). There is published research for each of the Standards. There is no reasonable scientific doubt that mothers who follow the maternal behaviors called the Seven Standards will experience an extended duration of breastfeeding amenorrhea. At the same time, it must be recognized that **there is a range in the duration**. An average is an average. Since the deep infertility of lactational amenorrhea is somewhat reduced after eight weeks

postpartum, mothers who have a relatively serious need to postpone pregnancy further should begin their normal fertility observations at that time. Mothers doing ecological breastfeeding generally delay such observations until the baby starts taking other liquids or solids around six to eight months of age. If a mother becomes pregnant before she has a first period, her temperature record is extremely valuable for estimating the time of ovulation and the date of childbirth.

Additional research is available at http://nfpandmore.org/nfpresearch.shtml.

Among couples who are using Ecological Breastfeeding as their only form of birth spacing, abstinence does not present a problem because the spouses do not practice systematic NFP with abstinence during the fertile time. Abstinence can be somewhat extended for some couples who want to have additional spacing and thus start to practice systematic NFP. A problem sometimes arises when the breastfeeding mother experiences a cervical mucus discharge for an extended time. In their books on natural family planning, the Kippleys related the experience of some breastfeeding mothers who have become familiar with the internal observations of the cervix and find this very helpful. That is, with some experience, they come to recognize that the cervix is not giving signs of fertility although there may be some form of cervical mucus externally. And most NFP organizations teach how to try to distinguish between an all-the-time mucus and the kind of mucus that truly is an indication of fertility.

Another approach has been developed by a Canadian doctor, **Thomas Bouchard** in Calgary, working with Richard Fehring and Mary Schneider in Milwaukee. In 2012 they published a study in which breastfeeding mothers used the electronic hormonal fertility monitor (EHFM) mentioned previously. ("Efficacy of a New Postpartum Transition Protocol for Avoiding Pregnancy," *J Am Board of Fam Med (JABFM)* 2012; 26:1 35-44). They used this not only during breastfeeding amenorrhea but also during cycles up to 12 months postpartum. The purpose of the monitor is to detect a critical level of estrogen sufficiently before the true fertile window starts. Results: "There were 8 unintended pregnancies per 100 women at 12 months postpartum. With correct use, there were 2 unintended

pregnancies per 100 woman at 12 months" (abstract, 35). In personal communication, Professor Fehring told me that this system can reduce abstinence in some cases by 50 percent. While somewhat expensive—test strips cost $1 to $2 per day—this may be helpful for some couples. At the least, it is promising.

It should also be noted that most mothers doing Ecological Breastfeeding would still be in amenorrhea at 12 months postpartum

Computerized charting and interpretation. Computerized charting has been around for a while. A couple using the STM proudly showed me their self-designed Commodore 64 charting system in the early to mid-Eighties. In the early 2000's a computerized thermometer—the L-Sophia—was made and marketed in Japan. Father Anthony Zimmerman, SVD, an American priest serving for many years in Japan, was enthusiastic about it. In 2002 a pharmacist in Louisiana was a distribution agent for the next generation called simply the Sophia. The advent of smart-phones has led to many "apps." Most seem to be just for charting, but some probably attempt interpretation as well. The current author admits ignorance of these recent developments except to know that there has been considerable controversy about their interpretation accuracy. Limited experience with the L-Sophia suggested at the time that computerized interpretation tends to be more conservative, thus calling for more days of abstinence, than interpretation via the standard STM rules used by NFP International. This subject needs further research, and our treatment here will be developed as more experience is acquired.

What we like about paper charts is that they can be easily scanned and sent to teachers for review and assistance with interpretation.

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Part 3: Sociological and Theological Events Related to Natural Family Planning

1798. *Essay on the Principle of Population.* Anglican clergyman and economist Thomas R. Malthus raises fear that increasing population will exceed increased food production. He advises late marriages and self-control to lower the birth rate.

1823. Neo-Malthusians drop the morality of Malthus and promote contraception.

1839. The invention of latex simplifies production of condoms.

1853 and 1880. The Vatican office dealing with the Sacrament of Penance makes decisions that accept the principle of practicing chaste abstinence during the fertile time to avoid pregnancy.

1873. Protestant reformer Anthony Comstock obtains the passage of American federal and state laws against the sale and distribution of contraceptives at a time when Catholics have little or no influence in legislatures.

1908. The Church of England rejects efforts to get it to accept marital contraception.

1914. Margaret Sanger starts her public advocacy of contraception.

1920. The Church of England again rejects marital contraception.

1930. The Church of England accepts marital contraception in August, 1930. Anglican conservatives correctly predict this will lead to the acceptance of sodomy.

1930, December 31. Pope Pius XI in *Casti Connubii* reaffirms Catholic teaching against unnatural forms of birth control and criticizes the Church of England for its break from the previously universal Tradition.

1931, February 21. Federal Council of Churches (USA) accepts marital contraception.

1936. A Federal Court starts to dismantle the Comstock laws, ruling that what doctors do with contraceptives is not immoral.

1941. Pope Pius XII encourages all mothers to breastfeed their babies if at all possible.

1960. The oral contraceptive birth control Pill goes on sale in USA.

1965. In *Griswold v Connecticut* the U.S. Supreme Court invents its privacy doctrine and strikes down all state laws against the sale and distribution of contraceptives to married couples.

1967, February 25. "Holy Communion: Eucharistic and Marital" by John F. Kippley in *Ave Maria* magazine. I have been told that apparently this is the first published statement that the marriage act ought to be a renewal of the marriage covenant.

1968. Pope Paul VI in *Humanae Vitae* reaffirms the teaching of *Casti Connubii* and encourages NFP user couples to teach NFP to other couples.

1969. First-ever publication of a book dealing with breastfeeding and natural baby spacing, Sheila Kippley's *Breastfeeding and Natural Child Spacing.*

1970. *Covenant, Christ and Contraception* by John F. Kippley to uphold and explain the teaching of *Humanae Vitae*. Apparently the first book-length treatment of the covenant theology: "Sexual intercourse is intended by God to be, at least implicitly, a renewal of the marriage covenant."

1971. John and Sheila Kippley with the help of Dr. Konald A. Prem start the Couple to Couple League (CCL) to teach ecological breastfeeding, systematic NFP and the covenant theology through trained ordinary lay user couples.

1972. In *Eisenstadt v Baird* the U.S. Supreme Court strikes down all federal and state laws against the sale and distribution of contraceptives to unmarried persons.

1972. Formation of the Billings Ovulation Method organization.

1972. Publication of first edition of *The Art of Natural Family Planning* by John and Sheila Kippley.

1973, January 22. In *Roe v Wade* the U.S. Supreme Court applies its privacy doctrine to abortion and strikes down all federal and state laws against abortion.

1979. Pope John Paul II begins ten years of world-wide reaffirmation of the teaching of *Humanae Vitae.* September 19: He delivers the first of his 129 "Theology of the Body" lectures during his Wednesday audience.

1981. *Familiaris Consortio* by Pope John Paul II gives strong support to the teaching of natural family planning, especially in section 35.

1984. November 28. Pope John Paul concludes his series of 129 Wednesday audiences titled The Theology of the Body.

1987. Pope John Paul II tells bishops in Los Angeles that the idea that dissent from *Humanae Vitae* poses no obstacle to receiving the Eucharist is "a grave error that challenges the teaching office of bishops."

1988. Pope John Paul II makes strong doctrinal statements that conclude ten years of affirming *Humanae Vitae*. Dissent "is equivalent to refusing God Himself the obedience of our intelligence." The traditional teaching is "a central point of Christian doctrine concerning God and man." (Details in *Sex and the Marriage Covenant,* Ignatius Press, 2005).

1989. A U.S. Bishops' Committee urges bishops and priests to require all engaged couples to attend a full course on natural family planning as a normal part of preparation for marriage.

1995. Pope John Paul II co-hosts with the Royal Society of Great Britain a conference on breastfeeding in which he endorses the recommendations of the WHO and UNICEF to breastfeed babies exclusively for four to six months and with supplements "up to the second year of life or beyond." Currently (2016) these organizations recommend six months of exclusive breastfeeding.

1996. Publication of the 530-page Fourth Edition of *The Art of Natural Family Planning* by the Kippleys.

2003, December 9. Separation of the Kippleys and the Couple to Couple League.

2004. Due to post-separation changes in the teaching of NFP at the CCL, the Kippleys form a new organization, Natural Family Planning International (NFPI), to keep alive the Triple-Strand charisms on which they founded the CCL in 1971.

2005. First edition of a new NFP manual for NFP International.

2005. NFPI website opens at www.nfpandmore.org

2007, April 23. Sheila Kippley's first blog at NFPI website.

2007, December 12. CCL announces its Extreme Makeover that drops ecological breastfeeding, drops the covenant theology, and makes significant changes in its teaching of systematic NFP.

2008, October 2. Pope Benedict XVI reaffirms truth and value of *Humanae Vitae* in his address to the John Paul II Pontifical Institute for Studies on Marriage and Family.

2009. *Natural Family Planning: The Complete Approach* by the Kippleys becomes available in coil and perfect bindings and is downloadable from the NFPI website.

2013, January 31. Mary Eberstadt's book, *Adam and Eve after the Pill,* reviews sociological literature about the damages done by the Pill.

2014, March 5 interview. Pope Francis affirms truth of *Humanae Vitae.*

2014, October 13. Jonathan Eig's book, *The Birth of the Pill,* provides a secular appraisal, mostly negative, of the development and the effects of the Pill.

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