

ISSUE BRIEF

THE BIRTH CONTROL PILL — A HISTORY

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In the middle of the 20th century, an age-old quest for safe and effective oral contraception was realized.

The woman who made that happen was Margaret Sanger (1879–1966), the founder of the American Birth Control League, the forerunner of Planned Parenthood[®] Federation of America (Chesler, 1992).

Planned Parenthood has played and continues to play a central role in making safe and effective family planning, including the pill, available to women and men around the world:

- from 1916, when Margaret Sanger opened the first birth control clinic in America
- to 1950, when Planned Parenthood underwrote the initial search for a superlative oral contraceptive
- to 1952 when Planned Parenthood helped found the International Planned Parenthood Federation
- to 1965, when Planned Parenthood of Connecticut won the U.S. Supreme Court victory, *Griswold v. Connecticut* (*Griswold*), that finally and completely rolled back state and local laws that had outlawed the use of contraception by married couples
- to today, when Planned Parenthood continues leading the family planning movement by successfully defending and expanding women's reproductive rights and options against those who would diminish them (Chesler, 1992; Feldt & Knowles, 2002).

MARGARET SANGER'S BRAINCHILD

In her 70s, and years after most people retire, Sanger achieved one of the greatest accomplishments of her career. As Honorary President and Chair of Planned Parenthood Federation of America, she drove the research and development of the century's most revolutionary medical breakthrough — after penicillin — the pill. Sanger had won for most women in the U.S. the right to use contraception. Now she would develop a method that was nearly 100 percent effective.

Katharine Dexter McCormick (1875–1967)

In the 1940s and 1950s, Sanger closely followed scientific research on birth control and personally funded some of it. Planned Parenthood Federation of America also made support for new birth control technology a major focus of its advocacy efforts. The turning point came when Sanger's longtime friend — Katharine Dexter McCormick — threw her financial support behind research to produce an oral contraceptive (Chesler, 1992).

McCormick was Sanger's closest collaborator during her career. She was an avid crusader for women's rights, had been a leader in the suffrage movement (Fields, 2003), had helped establish the League of Women Voters (Fields, 2003), and was the second woman to graduate from the Massachusetts Institute of Technology (Fields, 2003), where she studied biology.

McCormick was also heir to the International Harvester fortune. In 1950, following the death of her husband, Stanley, McCormick wrote to Sanger to

ask how she could use her inheritance to contribute to contraceptive research (Chesler, 1992). This helped Sanger shift her search for an oral contraceptive into high gear during 1951 (Chesler, 1992).

In 1953, Sanger took McCormick on a personal visit to the Worcester Foundation for Experimental Biology in Massachusetts, where research scientists Gregory Pincus and Min Chueh Chang were conducting experiments that Sanger considered promising — at her behest, they were trying to produce an oral contraceptive based on synthetic progesterone.

Inspired by the visit, McCormick — also in her 70s — used her scientific knowledge to watch over the research process. As Gregory Pincus said, “she knew the field” (Fields, 2003). And she used her inheritance to supply the financial backing that was so desperately needed.

McCormick first pledged \$10,000 toward the research. Soon after, she began contributing \$150,000 to \$180,000 a year, funneling a portion of the money through Planned Parenthood’s research grant program. (Planned Parenthood had supported Pincus’ early studies on mammalian eggs that led him to the work he would do on the development of the pill.) The total of McCormick’s gifts to the research was \$2,000,000, which would be more than \$18,000,000 in today’s dollars (Asbell, 1995; Chesler, 1992; Grimes, 2000).

All in all, McCormick donated the lion’s share of the financial resources needed for the research that enabled the fulfillment of the dream she shared with Sanger — making birth control safe, dependable, affordable, and controlled by women (Chesler, 1992).

The efforts to develop an oral contraceptive would have been for naught, however, if it hadn’t been for the medical folk traditions of the descendants of the Aztecs. The basic research for the pill became possible when Russell Marker discovered that generations of Mexican women had been eating a certain wild yam — the Barbasco root, also called

cabeza de negro — for contraception (Asbell, 1995). It was from these yams that Marker was able to extract the progestin that Gregory Pincus combined with estrogen to formulate the first birth control pill (Grimes, 2000).

Dr. John Rock (1890–1984)

McCormick also funded the first clinical trials of the pill, which were conducted by Dr. John Rock, an eminent gynecologist and a Roman Catholic, with patients in his private practice. Rock, who came to be regarded as a co-developer of the pill, worked with Planned Parenthood staff on a closely reasoned book, *The Time Has Come: A Catholic Doctor’s Proposals to End the Battle over Birth Control*, in which he argued — unsuccessfully — that the Catholic church should accept the oral contraceptive as a natural extension of the “rhythm method” (Chesler, 1992).

But distributing contraceptives or information about contraceptives was illegal in Massachusetts, so Rock had to find another venue for wider clinical trials, or pay a \$1,000 fine each time he or one of his staff gave a contraceptive or contraceptive advice to one of the women in the trial (or spend five years in prison) (Marks, 2001). Holding yearlong, large-scale trials in other states where contraception was legal was also challenging because, after World War II, American women of reproductive age became highly mobile. Keeping a trial cohort together for up to three years was absolutely necessary, so less mobile populations of women were sought (Marks, 2001).

After also considering Japan, Hawaii, India, Mexico, and New York, Rock and his colleagues settled on Puerto Rico as the best place to hold the trials (Marks, 2001). From the very beginning, this decision opened them to fallacious charges of racism (Tone, 2001; Marsh & Ronner, 2008). In fact, they settled on Puerto Rico for several reasons:

- It had no laws against contraception.
- It had a well-established network of birth control clinics.
- It was close enough to the U.S. to allow easy visits from the research team.
- Many medical practitioners on the island had been trained in the U.S., and Pincus knew and trusted them.
- Many of the women were semi-literate or illiterate, which allowed the researchers to test whether or not the pill could also be used by women around the world, regardless of their educational accomplishments.
- Puerto Rico was an island with a relatively stable population that could be followed for the full length of the trial.
- Many Puerto Rican women were eager to have more effective methods of reversible birth control than those that were available to them (Marks, 2001; Tone, 2001; Marsh & Ronner, 2008).

Participants had to meet four criteria: They had to be in good health. They had to be under 40. They had to have had at least two children — to prove they were fertile. And they had to agree to have a child if they became pregnant during the study (Tone, 2001).

Critiques of the Clinical Trials for the Pill

Critics of the early pill trials point out retrospectively that the women involved did not give informed consent with their signatures. In the late '50s and early '60s, however, having subjects sign informed consent documents to participate in clinical trials was not a common procedure. In the 1980s, Dr. Luigi Mastroianni, one of John Rock's colleagues, recalled that

The concept of informed consent that is so talked about now, and is a legal requirement of any research project involving human volunteers, didn't exist then. But Rock practiced it [informed consent] before it was ever defined. There were always long and large discussions of the risk factors. It didn't matter that Rock had no formal guidelines, he set his own, and they were high standards indeed (Marks, 2001).

Retrospective critics have been concerned that the clinical trials did not meet today's standards. But the pill was thoroughly tested by the standards of the day. Today, the numbers of women in the trial and the amount of time they were observed would not be acceptable. Before the FDA approved the pill in 1960, 221 women in Puerto Rico had taken it in two clinical trials. More than 130 of them had used it for between one and three years. Thousands more in Australia, Britain, Ceylon, Chicago, Haiti, Hong Kong, Japan, Los Angeles, Mexico City, Seattle, and Tennessee were involved in clinical trials of various formulations of the pill. Another 500,000 women had used the first brand — Enovid — for up to three years for menstrual regulation. But in the end, Searle submitted reports on only 897 women in its application for FDA approval (Asbell, 1995; Marks, 2001; Marsh & Ronner, 2008).

By today's standards, these were small clinical trials, but small trials were not unusual at that time. For example, the 1960 approval of Librium to treat anxiety was based on the experience of only 570 psychiatric patients, although 593 other patients used it for a wide range of conditions that included eczema, "frigidity," heroin addiction, and spastic colon (Junod & Marks, 2002; History of Psychology, 2010).

A Smashing Success

The clinical trials began in April 1956 (Marsh & Ronner, 2008). That same year, the journal *Science* announced their ongoing success. In 1957, the FDA approved the use of the pill to regulate menstruation. By 1959, 500,000 women were ostensibly using it to keep their

periods regular, while enjoying its contraceptive “side effects.” They knew the medication had contraceptive effects because every package had a warning about its “contraceptive activity” on the label (Asbell, 1995).

On June 23, 1960, the FDA approved the sale of Enovid for use as an oral contraceptive. It was manufactured by G.D. Searle and Company, a firm that had also supported Gregory Pincus’ research for many years (Chesler, 1992; FDA, 2000; Grimes, 2000; Lange, 2007).

By 1965, one out of every four married women in America under 45 had used the pill. By 1967, nearly 13 million women in the world were using it. And by 1984 that number would reach 50–80 million (Asbell, 1995). Today 100 million women use the pill (*Population Reports*, 2000).

Sanger’s tenacious efforts, even as her health declined, brought about the advent of safe and effective oral contraception and changed the human sexual landscape forever. It reduced the risk of unintended pregnancy in the context of the sexual revolution of the ‘60s and established family planning as the cultural norm for the U.S. and in many other countries of the world.

THE FIRST PILL

The first pill was effective and simple to use. It extended to millions of women an unheard-of control over reproduction, for the first time allowing them to truly separate vaginal intercourse from procreation (Bullough & Bullough, 1990). But it was far from perfect.

The first brand, Enovid, had a lot more hormones in it than needed to prevent pregnancy. It contained 10,000 micrograms of progestin and 150 micrograms of estrogen. In comparison, today’s lower-dose pills are more likely to contain 50–150 micrograms of progestin and 20–50 micrograms of estrogen (Knowles & Ringel, 1998; Tone, 2001).

Side Effects and Adverse Events

The original high doses increased the likelihood and severity of side effects and the potential for rare but very serious risks, such as heart attack and stroke. Unfortunately, it took scientists more than a decade to recognize the risks and side effects and to learn that much lower doses were just as effective as the higher doses at preventing pregnancy.

Side effects had been very apparent in the first clinical trials. Dr. Edris Rice-Wray, who was in charge of the first trials in Puerto Rico, reported early on that 17 percent of the women in the first cohort had significantly unpleasant side effects, including dizziness and nausea, as well as headaches and vomiting. In fact, 25 of them withdrew from the trials because the medication made them so uncomfortable.

In her first report, Rice-Wray concluded that although the pill provided nearly 100 percent protection against unintended pregnancy, “it causes too many side reactions to be acceptable generally” (Asbell, 1995; Marsh & Ronner, 2008).

Gregory Pincus, the head of the research team, was delighted with Rice-Wray’s report that the pill was so effective at preventing pregnancy by suppressing ovulation. But he ignored Dr. Rice-Wray’s concerns about side effects. Perhaps because Pincus was a biologist, not a physician, he had little clinical empathy for what he regarded as hypochondria among the women in the trials (Marsh & Ronner, 2008).

Not only did many women in the first clinical trials in Puerto Rico have distressing side effects, one woman died of congestive heart failure, and another developed pulmonary tuberculosis (Marks, 2001). During medical checkups and in reports on the women in the trials, however, researchers were so focused on watching for carcinogenic effects and damage to the cervix, endometrium, liver, and ovaries that it did not occur to them that these adverse events were related to the pill (Marks, 2001; Marsh & Ronner, 2008).

Early critics of the pill were right that a lot could be done to improve it. Among the millions of women using the pill worldwide, there were disturbing reports of nausea, breast tenderness, water retention, and weight gain.

Much more alarming was G.D. Searle's 1961 report to the FDA of 132 incidents of thrombosis (blood clots) and embolism (clots moving through and blocking a blood vessel) among women using the pill. But the FDA held that even if the pill caused these adverse events, the rate of them — 1.3 out of 100,000 users — was much lower than the rate of women who would die from pregnancy complications — 36.9 out of 100,000 pregnant women (Asbell, 1995; DHS, N.D., Table 5-1).

The governments of Norway and the Soviet Union were not reassured, and they banned the sale of the pill in 1962 (Asbell, 1995).

Barbara Seaman, Gaylord Nelson, and Hugh Davis

Among the most vocal, and certainly most effective, critics of the pill in the U.S., was Barbara Seaman, who published *The Doctor's Case Against the Pill* in 1969. Seaman gave a sensationalized account of hundreds of women who suffered side effects and adverse reactions that she and many others associated with the pill. She also attacked the American College of Obstetricians and Gynecologists and Planned Parenthood Federation of America for providing the pill, which she claimed was dangerous for all women.

Medical science would prove Seaman right about some of the adverse events she claimed were associated with the pill (e.g., blood clots and strokes) and it would prove her very wrong about others (e.g., cancer, harmful genetic effects, and sterility) (Seaman, 1969; Tone, 2001).

Seaman's book was important because it prompted Senator Gaylord Nelson (D-WI) to hold hearings on

whether the pill was dangerous for the human body and whether women who used the pill had enough information about possible risks and side effects to make an informed decision to use it (Lehmann-Haupt, 1970; Tone, 2001).

While many who questioned the use of the pill were entirely motivated by an interest in women's health, some were not. Hugh Davis, for example, was one of the few gynecologists who spoke at Senator Nelson's hearings. He was, in fact, Nelson's lead speaker, and he had a financial stake in the development and success of the IUD. He was also one of the important medical authorities who gave credibility to Seaman's attack on the pill in her book.

Davis argued in Seaman's book and testified at the Nelson hearings that women would be safer using a new IUD instead of the pill. During his testimony, Davis covered up the fact that he had a financial interest in promoting this new IUD — the Dalkon Shield, which later proved to be a health catastrophe for thousands of women and the cause of bankruptcy, in 1985, for its manufacturer, A.H. Robins (Asbell, 1995; Tone, 2001; Marsh & Ronner, 2008).

The Package Insert

Nelson's hearings on the safety of the pill ran from January 14 through March 1970. Feminists of the day demonstrated against them because no women were asked to speak about their experience with the pill. But the hearings did contribute to the FDA's eventual decision that pill packaging must contain an insert with information about possible risks and side effects.

Hundreds of women had written letters to the FDA during the Nelson hearings to demand that manufacturers be compelled to give them information about the possible side effects of the medication they were taking. And it was during the Nelson hearings that the FDA announced that it would compose information on the possible side effects

of the pill for a package insert that would be included with every package of pills.

But the American Medical Association opposed the use of a package insert, not a common practice at the time, on the grounds that it would undermine a doctor's authority with "his" patients.

The FDA backed off from including an insert but did require doctors to give the information to women whenever they prescribed the pill. Between 1970 and 1975, however, doctors distributed only four million copies of the information to the 10 million women for whom they prescribed the pill every year. It wasn't until 1978 that the FDA required that the information be inserted into the pill packages — and it wasn't until 1980 that the FDA required that the package insert be intelligible to the average reader (Marks, 2001; Tone, 2001).

It was during women's struggle for information about the benefits and risks of using the pill, which lasted for two decades during the '60s and '70s, that Planned Parenthood earned a good deal of the respect it enjoys today. **During the information wars between Congress, the FDA, the AMA, and advocates for women, Planned Parenthood filled the gap with its own client information publications about the pill and developed its own medical standards and guidelines to ensure that all women who came to Planned Parenthood for the pill would receive balanced information about its risks and benefits** (PPFA, 1976).

Despite the controversies around the pill, in 1970, President Richard M. Nixon signed into law Title X of the Public Health Services Act, which provided federal support and funding for family planning services. Working with Title X grants, Planned Parenthood was able to provide access to the pill to hundreds of thousands of low-income women across the United States.

A year later, PPFA established its own international program, which was funded largely by the U.S. Agency for International Development. With USAID grants,

Planned Parenthood was able to bring effective and safe modern methods of birth control — including the pill — to millions of women and men around the world (Feldt and Knowles, 2002).

The cultural ramifications of the widespread use of the pill are nearly impossible to measure. Most women in the '70s believed the benefits of the pill far outweighed the risks. They agreed with Loretta Lynn that the pill was a key to their liberation. As she sang in her hit song of 1975, "Since I've Got the Pill"

...

*All these years I've stayed at home
While you had all your fun
And every year that's gone by
Another baby's come
There's a-gonna be some changes made
Right here on nursery hill
You've set this chicken your last time
'Cause now I've got the pill*

...

*This incubator is overused
Because you've kept it filled
The feelin' good comes easy now
Since I've got the pill
It's getting' dark it's roosting time
Tonight's too good to be real
Oh but daddy don't you worry none
'Cause mama's got the pill
Oh daddy don't you worry none
'Cause mama's got the pill (McHan, 1973)*

TODAY'S PILL

In 1993, *The Economist* named the birth control pill one of the Seven Wonders of the Modern World because, "When the history of the 20th century is written, it may be seen as the first [time] when men and women were truly partners. Wonderful things can come in small packets" (May, 2010).

The pill is still America's most popular reversible method of contraception. Nearly 19 percent of all women be-

tween 15 and 44 use the pill (Mosher et al., 2004). That comes to more than 30 percent of all women who use birth control (Guttmacher Institute, 2008).

Effectiveness

If the pill is used as directed, only three out of 1,000 women will become pregnant in the first year of use. About eight out of 100 less consistent users will become pregnant in the first year of use (Nelson, 2007).

Mechanism of Action

The pill works by inhibiting ovulation and by thickening cervical mucus, which prevents sperm from entering the fallopian tubes where fertilization takes place. The theory that the pill interferes with implantation has not been proved (Nelson, 2007).

Possible Side Effects and Risks

Possible side effects that usually last only the first three months include breast tenderness, headaches, irregular bleeding, and nausea. Some women also experience changes in their sex drive (Nelson, 2007).

Rare but serious health risks include blood clots, heart attack, stroke, increased blood pressure, liver tumors, gallstones, and jaundice — women who are over 35 and smoke are at a greater risk for some of these problems (Nelson, 2007).

Non-Contraceptive Uses of the Pill

The combined hormone contraceptive pill is the first line of therapy for women who prefer to have no periods and for otherwise healthy women who have

- absence of menses due to hyper athleticism or eating disorders
- anemia due to heavy menses
- certain kinds of recurring ovarian cysts

- emotional challenges that cause fear of menstrual bleeding
- family histories of cancer of the ovaries
- heavy, infrequent, irregular, or painful menses
- non-menstrual uterine bleeding
- personal risks for cancer of the endometrium
- premenstrual dysphoric disorder
- symptoms of premenstrual syndrome (Nelson, 2007)

Non-Contraceptive Benefits of the Pill

Use of combined hormone oral contraceptives has many non-contraceptive benefits. These advantages include

- decreased chances of ectopic pregnancy
- decreased risk of serious infections of the ovaries, fallopian tubes, and uterus (pelvic inflammatory disease)
- less menstrual flow and cramping
- quick return of ability to become pregnant when use is stopped
- reduced acne
- reduced bone thinning
- reduced iron deficiency anemia related to menstruation
- reduced premenstrual symptoms, such as depression and headaches
- reduced risk of ovarian and endometrial cancers

- reduced vaginal dryness and painful intercourse associated with menopause
- shorter and more regular periods (Nelson, 2007; Nelson & Stewart, 2007)

Safety

In early 2010, a study of 46,112 women in the U.K. who were observed for up to 39 years showed that using the pill did not, overall, increase a woman's risk of mortality. It showed, in fact, that pill use among these women may have increased longevity (Hannaford et al., 2010).

IMPACT OF THE PILL

It was just five years after the pill was approved for use as a contraceptive in 1960 that birth control became legal nationwide in the U.S. That is why the impact of the pill on the health and lives of women and their families will be forever intertwined with the 1965 U.S. Supreme Court decision in *Griswold v. Connecticut*, which protected the Constitutional right of married couples in this country to use birth control (*Griswold*). (It wasn't until 1972, in its decision in *Eisenstadt v. Baird*, that the Supreme Court found that unmarried people had the same Constitutional right to obtain contraceptives as married people [*Eisenstadt*]).

In the four decades since these events, profound and beneficial social changes occurred, in large part because of women's relatively new freedom to effectively control their fertility — maternal and infant health have improved dramatically, the infant death rate has plummeted, and women have been able to fulfill increasingly diverse educational, political, professional, and social aspirations.

Planning and Spacing Pregnancies

The ability to plan and space pregnancies has contributed to improved maternal, infant, and family health:

- In 1965, there were 31.6 maternal deaths per 100,000 live births (NCHS, 1967). By 2005, the rate had been reduced by 52 percent, to 15.1 maternal deaths per 100,000 live births (U.S. Census Bureau, 2009a).
- In 1965, 24.7 infants under one year of age died per 1,000 live births (NCHS, 1967). By 2005, this figure had declined to 6.9 infant deaths per 1,000 live births (U.S. Census Bureau, 2009a).

Since 1965, there has been a dramatic decline in unwanted births — the result of pregnancies that women wanted neither at the time they were conceived nor at any future time. This decline is particularly welcome because unwanted births are associated with delayed access to prenatal care and increased child abuse and neglect (Piccinino, 1994; Committee on Unintended Pregnancy, 1995).

- In 1961–1965, 20 percent of births to married women in the U.S. were unwanted (Mosher, 1988). By 2002, only nine percent of births to married women in the U.S. were unwanted (Chandra et al., 2005).

Mistimed births — those that happened sooner than the mother wanted them — have also declined markedly.

- In 1961–1965, 45 percent of births to married American women were mistimed (Mosher, 1988); in 2002, only 14.1 percent of births to married women in the U.S. were mistimed (Chandra et al., 2005).

Education and Employment

By enabling women to control their fertility, access to contraception broadens their ability to make other choices about their lives, including those related to education and employment.

Since 1965, the number of women in the U.S. labor force more than doubled, and women's income now constitutes a growing proportion of family income:

- In 1965, 26.2 million women participated in the U.S. labor force; by 2008, the number had risen to 71.8 million (U.S. Census Bureau, 2009a).
- The labor force participation rate of married women nearly doubled between 1960 and 2008 — from 31.9 to 61 (U.S. Census Bureau, 2009a).
- By 2008, 26.6 percent of women in dual-income families earned more than their husbands (U.S. Census Bureau, 2009b).
- Between 1960 and 2008, the percentage of women who had completed four or more years of college increased fivefold — from 5.8 percent to 28.8 percent (U.S. Census Bureau, 2009a).

Publicly Funded Programs

Publicly funded contraception programs have increased the ability of lower-income women to exercise the right to control their fertility.

Family planning services available through Medicaid and Title X of the U.S. Public Health Service Act help women prevent 1.94 million unintended pregnancies each year. Without these family planning services, the number of unintended pregnancies and abortions would be nearly two-thirds percent higher than it is (Gold et al., 2009).

Worldwide Impact

Women and men no longer need to abstain from sex for fear of having more children than they can afford or in terror of endangering a woman's health with a high-risk pregnancy. In 1965, 35 percent of married women in the U.S. used a safe and effective method of family planning. Only one out of 10 women in the developing world did so. Today approximately

50 percent of couples worldwide rely on modern methods of birth control to maintain the health and well-being of their families (PRB, 2009; Ryder & Westoff, 1971).

As more and more women are able to plan their families with modern methods of contraception — the IUD and methods such as the implant and injection, which derive from the research that developed the pill — the number of pregnancies per woman has decreased worldwide. This decrease has been identified as one of the key factors associated with recently reported and significant reduction in the rate of maternal mortality around the globe (Hogan et al., 2010).

As U.S. Secretary of State Hillary Rodham Clinton pointed out during the G8 Conference in Gatineau, Quebec, “You cannot have maternal health without reproductive health, and reproductive health includes contraception and family planning and access to legal, safe abortions” (Campion-Smith, 2010).

AGE-OLD NEED FOR BIRTH CONTROL

Having a baby is the least frequent motivator for most people to have sex (Hill, 1997). This seems to have been true for all people at all times throughout history. Contraceptives have been used in one form or another for thousands of years — throughout human history and even prehistory. In fact, family planning has always been widely practiced, even in societies dominated by social, political, or religious codes that required people to “be fruitful and multiply” — from the era of Pericles in ancient Athens to that of Pope Benedict XVI, today (Himes, 1963; Pomeroy, 1975; Blundell, 1995; Wills, 2000).

Of course the methods used before the 20th century were not always as safe or effective as those available today. Centuries ago, for example, Chinese women drank lead and mercury to control fertility, which often resulted in sterility or death (Skuy, 1995). During the Middle Ages in Europe, magicians advised women to wear the testicles of a weasel on their thighs or hang its amputated foot around

their necks (Lieberman, 1973). Other birth control amulets of the time included wreaths of herbs, desiccated cat livers, shards of cat bones (but only from the pure black ones), flax lint tied in a cloth and soaked in menstrual blood, or the anus of a hare. It was also believed that a woman could avoid pregnancy by walking three times around the spot where a pregnant wolf had urinated.

In more recent New Brunswick, Canada, women drank a potion of dried beaver testicles brewed in a strong alcohol solution. And as recently as the 1990s, teens in Australia used candy bar wrappers as condoms (Skuy, 1995).

Perhaps more surprising than such often bizarre and totally ineffective methods is that modern science has revealed many other ancient methods, especially certain herbal treatments, to be actually somewhat effective — though not always safe or practical (Riddle, 1992).

THE PILL — THE FIRST 2,500 YEARS

According to ancient Greek myth, Persephone, the goddess of spring, refused to eat anything but pomegranate seeds after she was stolen from her mother, Demeter, raped by the god of death, and kidnapped to the underworld. Medical historians now know why Persephone only ate pomegranate seeds — pomegranate was one of the first oral contraceptives.

Ancients used the myth of Persephone's abduction to explain the cause of the world's first winter — a time when the goddess withheld her fertility while confined in the underworld. All the winters that have followed are echoes of her tribulations, her mother's search for her, and her refusal to be pregnant when she didn't want to be (Riddle, 1997).

Greek women celebrated the reunion of Persephone and her mother for centuries in festivals called Thesmophoria. (All men were banned from them.) Four plants were central to the secret rituals of the festi-

val: pomegranate, pennyroyal, pine, and vitex, also known as "chaste-tree." All of these plants are now known to have contraceptive benefits as well as other effects (Hawley and Levick, 1995). It now appears that Greek women gathered in the Thesmophoria to share their contraceptive secrets (Riddle, 1997).

Herbal Infusions

In the seventh century B.C.E, a brisk contraceptive trade developed in the part of North Africa that is now known as Libya. That was the only place in the world that the flowering plant silphium grew. Silphium was such a reliable contraceptive that it fetched an exorbitant price (its weight in silver) in shipping ports all over the ancient world. Despite its staggering cost, the demand for silphium was inexhaustible. By the first century C.E., the plant was very scarce from over-harvesting, and by the fourth century, it was extinct (Riddle, 1997).

Women all over the world used various herbs for family planning. Surprisingly, one of the most comprehensive recipe books for pre- and post-coital herbal contraception was written by a man who later became pope. Peter of Spain, who offered advice on birth control and how to provoke menstruation in his immensely popular *Thesaurus Pauperum* (*Treasure of the Poor*), was elected Pope John XXI in 1276 (Riddle, 1992). Many of Peter's recipes have been found surprisingly effective by contemporary research, and it is now thought that women in antiquity had more control over their reproduction than previously believed (Riddle, 1994).

Hundreds of generations of women in Africa, Asia, and the Americas used various fruits and plants for family planning. Women in tropical India and Sri Lanka, for example, eat a papaya a day when they want to prevent pregnancy. It sounded improbable to scientists in the West, but in 1993, an English research team found that an enzyme in the fruit, papain, interacts with the hormone progesterone in a woman's body to prevent pregnancy (Brothers, 1994).

Contraceptive knowledge began to vanish in Europe after the 15th century. Women who had the knowledge became fearful about sharing it because to offer contraceptive information during these times was to risk being accused of witchcraft or heresy — the punishments for which included torture and death (Riddle, 1994).

European women in colonial America were offered contraceptive information by their Native-American neighbors and by their African-Caribbean slaves (Brodie, 1994). African-Americans held in slavery became extremely adroit in the use of contraception, which was important to them as a way to prevent the heartbreak of bearing children who could be sold for the profit of slave owners (Tone, 2001). Some of their formulas, still used in the rural South, can also be found in Peter of Spain's 750-year-old recipe book (Riddle, 1992).

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