

THE BIRTH
of
THE PILL

*How Four Pioneers
Reinvented Sex and Launched
a Revolution*

JONATHAN EIG

MACMILLAN



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A Winter Night

Manhattan, Winter 1950

She was an old woman who loved sex and she had spent forty years seeking a way to make it better. Though her red hair had gone gray and her heart was failing, she had not given up. Her desire, she said, was as strong and simple as ever: She wanted a scientific method of birth control, something magical that would permit a woman to have sex as often as she liked without becoming pregnant. It struck her as a reasonable wish, yet through the years one scientist after another had told her no, it couldn't be done. Now her time was running out, which was why she had come to an apartment high above Park Avenue to meet a man who was possibly her last hope.

The woman was Margaret Sanger, one of the legendary crusaders of the twentieth century. The man was Gregory Goodwin Pincus, a scientist with a genius IQ and a dubious reputation.

Pincus was forty-seven years old, five feet ten and a half inches tall, with a bristly mustache and graying hair that shot from his head in every direction. He looked like a cross between Albert Einstein and Groucho Marx. He would speed into a room, working a Viceroy between his yellowed fingers, and people would huddle close to hear

what he had to say. He wasn't famous. He owned no scientific prizes. No world-changing inventions were filed under his name. In fact, for a long stretch of his career he had been an outcast from the scientific establishment, rejected as a radical by Harvard, humiliated in the press, and left with no choice but to conduct his varied and oftentimes controversial experiments in a converted garage. Yet he radiated confidence as if he knew the world would one day recognize his brilliance.

Pincus was a biologist and perhaps the world's leading expert in mammalian reproduction. In the 1930s, at the start of his professional career, he'd attempted to breed rabbits in Petri dishes using much the same technology that decades later would lead to *in vitro* fertilization for humans. Then he was young and handsome and possessed of a limitless imagination. He posed for newspaper photographs and boasted to reporters that a new age of human reproduction was on the horizon, one in which men and women soon would employ modern methods to control the process of making babies. Science would lead the way.

But Americans were not ready to hear such things. The press compared him to Victor Frankenstein, Mary Shelley's fictional scientist, who tried to conjure life but accidentally created a monster. Harvard denied Pincus tenure, and no other university would hire him. He was deemed too dangerous.

At that point, a more humble man might have chosen a new line of work. A weaker man might have succumbed to anger or despair. But not Goody, as his friends and family called him, as much for his friendly nature as his middle name. For while Pincus was affectionate and disarming in social settings, when it came to his career he was, as one colleague put it, "a street-fighting Jew." Getting knocked down was merely the thing that happened before Pincus got up to fight again. When Harvard dumped him and no other job offers arrived, he moved to Worcester, Massachusetts, a factory town, where a former colleague from Harvard had offered him a low-paying, low-ranking position as a researcher for Clark University. He worked in

a basement lab where dust from a nearby coal bin contaminated his experiments. When he asked the university to provide him a proper laboratory, the request was denied.

Again, he might have quit. Instead, Pincus and one of his colleagues, Hudson Hoagland, did something unprecedented: they launched their own scientific research center. They went door to door in Worcester (pronounced *wuhstah*, in the local tongue) and the surrounding area, distributing brochures and asking housewives, plumbers, and hardware store owners to contribute—no donation too small—to a new institution they called the Worcester Foundation for Experimental Biology. With the money they scraped together, they bought an old house in nearby Shrewsbury, where Pincus set up his office and lab in the garage. The operation was so lean in those early years that he cleaned his own animal cages and, at one even lower moment, moved his wife and children into a state-run insane asylum while conducting research there on schizophrenia.



Pincus knew about Sanger. Almost everyone in America did. It was Sanger who had popularized the term “birth control” and almost single-handedly launched the movement for contraceptive rights in the United States. Women would never gain equality, she had argued, until they were freed from sexual servitude. Sanger had opened the nation’s first birth control clinic in Brooklyn in 1916 and helped launch dozens more around the world. But even after decades of work, the contraceptive devices available at those clinics—condoms and cervical caps, mostly—remained ineffective, impractical, or difficult to obtain. It was as if she’d been teaching starving people about nutrition without giving them anything healthy to eat. Sanger explained to Pincus that she was looking for an inexpensive, easy-to-use, and completely foolproof method of contraception, preferably a pill. It should be something biological, she said, something a woman

could swallow every morning with her orange juice or while brushing her teeth, with or without the consent of the man with whom she was sleeping; something that would make sexual intercourse spontaneous, with no forethought or messy fumbling, no sacrifice of pleasure; something that would not affect a woman's fertility if she wished to have children later in life; something that would work everywhere from the slums of New York to the jungles of southeast Asia; something 100 percent effective.

Could it be done?

The other scientists she'd approached, every one of them, had said no, and they had given her a long list of reasons. It was dirty, disreputable work. The technology wasn't there. And even if it somehow could be done, there would be no point. Thirty states and the federal government still had anti-birth-control laws on the books. Why go to the trouble of making a pill no drug company would dare to manufacture and no doctor would dare prescribe?

But Sanger held out hope that Gregory Pincus was different, that he might be bold enough—or desperate enough—to try.



It was the midpoint of the century. Scientists were taking up matters of life and death that once had been the domain principally of artists and philosophers. Men in lab coats—and yes, they were almost all men—were heroes, winners of wars, battlers of disease, givers of life. Malaria, tuberculosis, and syphilis were among the many illnesses surrendering to modern medicine. Governments and giant corporations poured unprecedented sums of money into research, sponsoring everything from high school science clubs to cold fusion exploration. Health became a political issue as well as a social one. World War II had scarred the earth but also transformed it, offering the promise of a better, freer world, and scientists were leading the way.

Americans were settling into new suburban box homes and exploring the joys of lawn care, dry martinis, and *I Love Lucy*. At least to the casual observer, the United States in the early 1950s appeared staid and steadfast. The Andrews Sisters sang “I Wanna Be Loved” and John Wayne starred in *Sands of Iwo Jima*, celebrating the nation’s military might and commitment to democratic ideals.

It was a glorious time to be an American. Young men returning from battle were looking for new adventures and new ways to feel like heroes as they adjusted to the dullness of their homes, marriages, and jobs. During the war, new rules of morality had applied. Sex had become a more casual endeavor as foreign women traded their bodies to American soldiers for cigarettes and cash. Girlfriends back home had written steamy letters filled with promises of the great passion awaiting their men. In truth, many of the women back home had been exploring their own new moral standards. The war had thrust women into the workplace, putting money in their pockets and liberating them from their parental homes. They’d begun dating and making love to men they did not intend to marry, experimenting with new ideas about intimacy and commitment. In 1948, a college professor in Indiana named Alfred Charles Kinsey published a study called *Sexual Behavior in the Human Male*, to be followed five years later by *Sexual Behavior in the Human Female*, and found that people were much friskier than they cared to admit, with 85 percent confessing to premarital sex, 50 percent acknowledging extramarital affairs, and almost everyone saying they masturbated. It would turn out that Kinsey was perhaps biased in his conclusions, but the impact of his work was nevertheless profound. In 1949, Hugh Hefner, a graduate student in sociology at Northwestern University, read Kinsey’s report and wrote a term paper arguing for an end to the repression of sex and sexuality in America. “Let us see if we cannot begin to find our way out of this dark, emotional, taboo-ridden labyrinth and into the fresh air and light of reason,” Hefner wrote, as he began preparing to do something about it personally.

Late one winter night in Manhattan, Margaret Sanger met Gregory Pincus to talk about nothing less than a revolution. No guns or bombs would be involved—only sex, the more the better. Sex without marriage. Sex without children. Sex redesigned, re-engineered, made safe, made limitless, for the pleasure of women.

Sex for the pleasure of women? To many, that idea was as unthinkable in 1950 as putting a man on the moon or playing baseball on plastic grass. Worse, it was dangerous. What would happen to the institutions of marriage and family? What would happen to love? If women had the power to control their own bodies, if they had the ability to choose when and whether they got pregnant, what would they want next? Two thousand years of Christianity and three hundred years of American Puritanism would come undone in an explosion of uncontrollable desire. Marriage vows would lose their meaning. The rules and roles of gender would be revocable.

Science would do what the law so far had not; it would give women the chance to become equal partners with men. This was the technology Sanger had been seeking all her life.

So, in a sleek Park Avenue apartment where long threads of cigarette smoke floated toward the ceiling, Sanger gazed across a coffee table at Pincus and made her pitch. She was seventy-one years old. She needed this. So did he.

“Do you think that it would be possible . . . ?” she asked.

“I think so,” Pincus said.

It would require a good deal of research, he added, but, yes, it was possible. Sanger had been waiting much of her life to hear those words.

“Well,” she said, “then start right away.”



The next morning, Pincus gunned the engine on his Chevrolet, snaking in and out of traffic toward Massachusetts as Sanger’s plea snaked in

and out of his overactive brain. Driving was new to him. He had only recently inherited this, his first car, from a scientist who had moved abroad, and he was thrilled to discover the speed and power at his command. Driving, like so much else in his life, became a competitive sport. His passengers would white-knuckle their armrests and ask why he was in such a hurry, but Pincus, utterly calm behind the wheel, thought little of it. “This is just my cruising speed,” he would say.

The 180-mile journey was full of stops and starts. Interstate highways were yet to come; for now, there were narrow, two-lane roads with slow-downs for school zones and train tracks. The long drive through cold, gray towns and hibernating farm plots gave Pincus time to reflect on his meeting with Sanger.

For as long as men and women have been making babies they’ve also been trying not to. The ancient Egyptians made vaginal plugs out of crocodile dung. Aristotle recommended cedar oil and frankincense as spermicides. Casanova prescribed the use of half a lemon as a cervical cap. The most popular and effective form of birth control in the early 1950s was the condom, a simple device that dated to the mid-1500s when the Italian doctor Gabriele Falloppio tested a “linen cloth made to fit the glans” to prevent the spread of syphilis. Since Falloppio, though, not much had changed. Condoms became cheaper and more widely available when the Goodyear company began vulcanizing rubber in the 1840s. Crudely fitted cervical caps—an early form of the diaphragm—began to appear at roughly the same time. But in the century that followed, little thought and even less effort had gone into innovation in the field. Pincus had no interest in those antiquated approaches. In his mind, inventing a birth-control pill—inventing anything, for that matter—did not have to be complicated. It was like driving. Step one: Choose your destination. Step two: Select a route. Step three: Try to get there as quickly as possible.

Instead of heading home, he drove to his office at the Worcester Foundation for Experimental Biology to speak with one of his

researchers, M. C. Chang. By 1950, Pincus and Hoagland had moved the Foundation from a renovated barn in Worcester to an ivy-covered brick home in a residential section of nearby Shrewsbury. “Outsiders have sometimes called the two-story Foundation building ‘the old ladies’ home,’” noted the *Worcester Telegram*. “That’s what it looks like from the Boston Post Road which runs by the door.”

Pincus and Hoagland did their best to make the old ladies’ home look like a hall of science. They converted the sun porch to a library. Bedrooms became laboratories. One bedroom-turned-laboratory became a bedroom again when Chang arrived from China by way of Scotland and England to work with Pincus. Though Chang spoke little English, Pincus had spotted something in the scientist, enticing him to join the Foundation for the paltry salary of \$2,000 a year (or about \$26,000 by today’s standards). Chang, who knew Pincus by reputation, thought he would be working in one of America’s prestigious institutes and that his fellowship would include free lodging, perhaps on campus, or at least nearby. He did get free lodging, but his room was at the YMCA. He and Pincus would travel to and from work by bus. Later, he would move to the Foundation, sleeping on a small bed in the corner of a converted laboratory and using Bunsen burners to heat his meager meals. As a strict Confucian, Chang didn’t mind. He reported proudly that for one important experiment in 1947 he had stored fertilized rabbit eggs in his kitchen refrigerator.

Pincus told Chang that he had spoken to Margaret Sanger about her desire for a pill to prevent pregnancy. It had to be a pill, he explained, not an injection, jelly, liquid, or foam, and not a mechanical device used in the vagina. When Pincus talked in this way—with a sense of purpose, hands chopping at the air, his eyes glittering beneath those bushy brows—his colleagues paid attention.

Goody Pincus was not one of those soft-spoken geniuses content to let his work speak for itself. He was a powerfully built man with a lean, muscular frame. Though his suits and ties were invariably cheap and

occasionally mismatched, he nevertheless carried himself with aristocratic self-possession. His voice was stentorian. Confidence was one of his strongest tools. He understood something many scientists did not: that scientific exploration and experimentation were only parts of the job; another equally important part was selling. An idea, no matter how good, might easily die if it were not aggressively pitched—to other scientists, to backers with deep pockets, and, ultimately, to the public. It was the selling that had helped sink him at Harvard, but Pincus was undeterred. He knew from the start that it would be one thing to build a birth-control pill and another to persuade the world to accept it. The scientist attempting such a task would have to be prepared to do both, or there would be little point trying.

Pincus and Chang discussed a scientific paper from 1937—“The Effect of Progesterin and Progesterone on Ovulation in the Rabbit,” by A. W. Makepeace, G. L. Weinstein, and M. H. Friedman of the University of Pennsylvania. It reported that injections of the hormone progesterone prevented ovulation in rabbits. Though it had been a huge discovery at the time, no one had tried to explore the implications for humans. There were many reasons. For one thing, scientists weren’t seeking innovations in contraception. There was neither prestige nor money in the work, only risk. And even if they had tried, progesterone was too expensive at that time to be widely used.

But when Pincus met Sanger and listened to her plea, attitudes on birth control were shifting—at least a little. Perhaps more important, however, was the evolution then taking place in the field of biology. Scientists were beginning to understand the inner workings of the body well enough to tinker with them. Before the 1950s drugs were mostly developed with the “suck-and-see” approach, as the British referred to trial-and-error experiments. A scientist would concoct a formula in a lab, gulp it down like Dr. Jekyll, and see what effects it had. But those days were nearing an end. Pincus and Chang knew how progesterone functioned. Now the task was to see if they could

produce it, modify it, and put it to use. Fortunately, new technology was making progesterone less expensive to obtain. If Sanger would pay for it, Pincus thought he had a good idea of how to proceed.

Pincus was no mere scientific technologist. He had the soul of a romantic. He looked to nature not only for answers but also for beauty. And here was something beautiful. Between puberty and menopause, women normally produce an egg roughly every twenty-eight days from one of their ovaries. The egg migrates down the fallopian tube to the uterus. If the woman has sex with a man and the man ejaculates, five hundred million sperm fight to fertilize her egg. If the egg is not fertilized, it can't implant itself in the lining of the womb, and if it can't implant itself, it is discharged along with the lining of the uterus. If it is fertilized, after about six days the egg can attach to the wall of the uterus, where the woman's blood will nourish it through the placenta. During this gestation, pregnancy begins: A zygote becomes an embryo and an embryo becomes a fetus. Two sex hormones, estrogen and progesterone, guide this process. Pincus focused largely on progesterone.

Often referred to as the pregnancy hormone, progesterone regulates the condition of the inner lining of the uterus. When an egg is fertilized, progesterone prepares the uterus for implantation and shuts down the ovaries so no more eggs are released. In effect, Pincus recognized, nature already had an effective contraceptive. Progesterone was preventing further ovulation to allow the fertilized egg to grow safe from harm. What if the same contraceptive could be delivered in a tablet form, effectively tricking the woman's body into thinking that it was already pregnant? A woman would be able to shut down ovulation any time she liked for as long as she liked. If she didn't release eggs, she couldn't become pregnant.

To Pincus, it was a solution elegant in its simplicity. It wasn't new. It wasn't radical. It was merely a matter of thinking differently about how to solve a problem.

He and Chang began by repeating the experiment done in Pennsylvania, adjusting the dosages and means of delivery to get a feel for progesterone and how it worked. They started with rabbits. Pincus sent a request for funding to the Planned Parenthood Federation of America, the women's health and advocacy group that Sanger had helped found. He asked for \$3,100: a \$1,000 stipend for Chang, \$1,200 for the purchase of rabbits, \$600 for animal food, and \$300 for miscellaneous supplies.

"I have \$2,000, perhaps a little more," Sanger wrote to Pincus a few weeks after their meeting. "Will this do?"

"The amount was ludicrous," Pincus recalled, "but I at once replied, 'Yes.'"

A Short History of Sex

FOR ALL ITS emotional resonance, not to mention its essential role in the survival of the human species, sex was a subject seldom studied in science.

In the 1950s, William Masters and Virginia Johnson observed that “science and scientist continue to be governed by fear—fear of public opinion . . . fear of religious intolerance, fear of political pressure, and, above all, fear of bigotry and prejudice.” So great was this fear at the time that even some medical textbooks on human physiology lacked entries for *penis* or *vagina*—which is too bad because, when it comes to sex, the human is a fantastically strange animal worth studying in fine detail. While most mammals use sex only for reproduction, humans, for reasons we still don’t fully understand, have evolved to use sex for recreation as well as procreation. And that has made our lives much more exciting than those of our ape cousins.

When a female baboon is ovulating, the skin around her vagina swells and turns bright red so male baboons can see it from a distance. In case the males are not looking her way, she also gives off a distinct smell. And if the bright red skin and strong smell don’t work, the female will squat in front of the male and present her hindquar-

ters. She knows when the time is right for sex, and she knows how to make it happen.

Such behavior is the norm among mammals. Humans are the strange ones. We're the ones who ovulate with almost no discernible clues. We're the ones who have sex at random times rather than waiting for the time around ovulation (also referred to as *estrus*) when pregnancy is most likely. When a female Barbary macaque is fertile, she'll have sex every seventeen minutes, getting it on at least once with every adult male in her troop. Gibbons go several years at a time without sex while waiting for the female to wean an infant and come into estrus. After a month of abstinence, female baboons will copulate up to one hundred times when they're fertile.

Most animals have sex because they want—or, rather, need—to procreate. Anything else would be a waste of time, and possibly dangerous, because they become vulnerable to attacks by predators when distracted by their mates.

So why do men and women have sex all the time, even when (make that *especially* when) we know fertilization is impossible? Anthropologists have long trumpeted one theory: that the human female has a difficult time raising her offspring alone (and had an even more difficult time in prehistoric days), so she keeps her man around by offering him sex whenever he wants it, even after she reaches an age when she can no longer reproduce. But not everyone buys that argument, and there are a lot more questions that still have scientists scratching their heads. For example, why do humans copulate in private when all other mammals do it in the open? And why do men have bigger penises, in proportion to their bodies, than their ape cousins?

For centuries, the beginning of life was a mystery. Everyone knew that a man had to ejaculate into a woman's body to achieve conception, but beyond that the process involved a lot of guesswork. Most anatomists up to the time of the Renaissance believed people came not from eggs but from seeds (*semen* is Latin for "seed"). Hippocrates

believed that conception required two seeds, a male and a female. Aristotle maintained a century later that human life began when the man's seed mixed with the woman's menstrual blood. The debate went on for almost two thousand years. Throughout that time, most people believed that an orgasm was required to generate the heat that a seed or seeds needed to spring to life. The woman had to have an orgasm too, this theory went, given that the conception occurred within her body. It was not until the seventeenth century that the Englishman William Harvey suggested that people come from eggs, and it took yet another two hundred years before scientists figured out that women ovulated monthly.

The science of reproduction might have advanced more swiftly if a few of the researchers involved had been women, but bias was not solely a feature of scientific research. Throughout most of human history, men and women have seldom been treated as equals where sex comes into play. In the Old Testament, when Sarah could not bear children for Abraham, Abraham took a maidservant for a mistress. King Solomon not only had hundreds of wives but had hundreds of concubines, too. In imperial Rome, a woman guilty of adultery was exiled from her home and banned from marrying again. Roman Catholic doctrine declared that sexual intercourse was only for procreation and that thinking or acting otherwise was a sin. In the sixteenth and seventeenth centuries, promiscuous women were burned at the stake. In Victorian England, women were told they were not supposed to enjoy sex, and men were encouraged to visit prostitutes rather than defile their own wives. To discourage promiscuity, birth control and abortion were outlawed in many countries, including the United States, and women were often forced to rely on illegal abortions to control family size. Not until the early twentieth century did anyone dare suggest that sex should be accepted and even embraced as healthy or something to be enjoyed by both men and women.

American attitudes toward sex took a big turn in 1909, when Sig-

mund Freud gave a series of lectures at the school that would briefly and halfheartedly take in the exiled biologist Gregory Pincus some thirty years later: Clark University in Worcester, Massachusetts.

Born in 1856 in the Austrian town of Freiberg, in what is now the Czech Republic, Freud studied medicine and specialized in nervous and brain disorders. He was influenced by the work of a Viennese colleague, Josef Breuer, who found that he could help deeply troubled patients by getting them to speak openly about the earliest occurrence of their symptoms. Freud theorized that many neuroses were rooted in trauma that had often been forgotten and hidden from consciousness. If patients could be helped to recall their experiences, he suggested, they could rid themselves of their neurotic symptoms.

In 1900, Freud published *The Interpretation of Dreams*. The unconscious mind was a powerful force, he proclaimed, and sexual drive was the most powerful of all determinants of a person's psychology. Sexual urges required gratification, Freud wrote; abstinence was both unnatural and potentially harmful. In Europe, critics complained that Freud was making too much of sexuality, and the good doctor came to be despised. But upon arriving in America he found a welcome and influential audience. "Don't they know we're bringing them the plague?" Freud asked his fellow analyst Carl Gustav Jung as the two men stood on the deck of their ship, staring down at the cheering throngs awaiting their arrival.

Most Americans never bothered to read Freud, but they came to understand, correctly or not, that he had endorsed sex as a desire equal in importance to hunger or thirst. His followers argued that sexual satisfaction was essential to happiness and mental health. Young women in particular, recalled the writer Malcolm Cowley, "were reading Freud and attempting to lose their inhibitions." Freudians did not worship Freud; they worshiped intercourse and orgasms. Among the believers, nothing satisfied desire and made the world a better place more than a mind-blowing, spine-shivering orgasm, or

“la petite mort” (the little death), as the French called it, suggesting a mystical quality to sex.

Margaret Sanger took up the cause, and so did Wilhelm Reich, another disciple of Freud. In 1923, Reich told the Vienna Psychoanalytic Society that he believed orgasm was the key to curing neuroses. “Genital stagnation,” he warned, would lead not only to emotional problems but also “heart ailments . . . excessive perspiration, hot flashes and chills, trembling, dizziness, diarrhea, and, occasionally, increased salivation.” Women and adolescents were particularly vulnerable, he said, because they were expected to remain abstinent (at least until marriage, for women) while men were free to satisfy their sexual appetites. Reich believed that everyone needed orgasms—and lots of them—to discharge their sexual energy and remain healthy. What’s more, he said, unless that energy was released, the world would never achieve progressive political or social reform. It would take nothing less than a sexual revolution—a term of Reich’s creation—to create a truly free society. Reich was the prophet of the orgasm. He even devised a special box—the Orgone Energy Accumulator—to help harness orgasmic energy, which he believed circulated in the atmosphere and in the human bloodstream. Norman Mailer, Saul Bellow, William Steig, and many other intellectuals later sat in the box (Albert Einstein considered it but politely declined). Eventually the federal government labeled Reich a fraud, but by then it didn’t matter. He had already inspired a generation of believers who would become central players in the sexual revolution.

After Reich came Alfred Kinsey. At first glance, Kinsey did not look like a radical. He wore a bow tie and crew cut as he lectured students at the University of Indiana, and he liked to invite his colleagues to his home to drink tea and listen to classical music from his impressive record collection. He married the first woman he ever dated and took her camping on their honeymoon so he could collect bugs. Sex interested him because it was a part of nature, but work

was his real passion. Kinsey was an entomologist who began his academic career studying gall wasps. Only when his students began asking questions about marriage did he begin reading all he could on human sexuality. Appalled by the scarcity of reliable information, Kinsey began his own studies. A radical empiricist, he viewed everything as quantifiable, whether it was orgasms or sex between humans and barn animals. Armed with nothing more than a notebook and a straight face, he set out to measure and categorize the variety of sexual conduct in America. He started by interviewing his students and soon, with a team of researchers, fanned out across the country.

Kinsey discovered he had a great gift for eliciting elaborate and secret information. By 1947, he was ready to publish his results. Among his findings: sex was good for marriage, masturbation did no harm, homosexuality was more widespread than most people assumed, and men and women cheated on their partners more frequently than most people believed. While others weighed in on whether homosexuals or unmarried sex partners were destined to go to hell, Kinsey reported the facts as science: “Mouth-genital contacts of some sort, with the subject as either the active or the passive member in the relationship, occur at some time in the histories of nearly 60 percent of all males.” But Kinsey’s most important finding was probably this one: Women desired sex, and not just to make babies. They masturbated, they enjoyed orgasms, and they slept around much the same as men did (although, according to Kinsey, they either did so less often or were less willing to admit it). Either way, Kinsey made Americans feel less shame about sex. He assured them their desires—even the kinky ones—were normal. His book, *Sexual Behavior in the Human Male*—which cost \$6.50 (about \$63 today), had 804 pages, and was published by W. B. Saunders, an older medical publishing company, in 1948—became a surprise bestseller.

Kinsey inspired young men like Hugh Hefner—who used the furniture in his small Chicago apartment as collateral for a bank loan to

launch *Playboy* magazine—to think of sex as something healthy and righteous. Hefner would soon see himself as a kind of Paul Revere in silk pajamas, a messenger of truth and freedom. He urged Americans to treat sex as something they were entitled to enjoy selfishly and ostentatiously, like fast cars, good food, and fine spirits.

Thanks to Freud, Reich, Kinsey, Hefner, and others, humans were more unusual creatures than ever by the middle of the twentieth century. They became fascinated by sex, convinced that it was the ultimate source of rapture. Young men began describing the stations of their sexual achievements in competitive terms such as “first base,” “second base,” and “scoring,” or “going all the way.” Everything seemed sexually charged. Even the cars of the day looked like phallic rocket ships—except for the Edsel, which had a grille that resembled a chrome vagina. Scandal magazines reported on the sex habits of the stars. Girlie magazines like *Flirt*, *Wink*, and *Titter* offered crude jokes and luscious pinups. Hollywood in the 1940s turned Betty Grable and Esther Williams into objects of sexual worship.

On the surface, the 1950s appeared to be a time of conformity and conservatism, but it was also an age of fear. Russia had the atomic bomb, so families built underground shelters stocked with canned goods and water to last for years and the Department of Defense hid Nike missiles underground all over the country in case of nuclear attack, from Michigan Avenue in Chicago to the Santa Monica Mountains in Malibu. U.S. Senator Joseph McCarthy launched a ruthless campaign to uncover suspected Communist sympathizers, tarring innocent, law-abiding citizens in the process. For women, it was an especially challenging time. They risked being seen as outcasts if they graduated from college without being married, got married and did not immediately have children, or had children but also wanted to work outside the home. To have a child out of wedlock was the greatest of shames.

Even women’s clothing was restrictive. “Fifties clothes were like

armor,” wrote Brett Harvey in the introduction to *The Fifties: A Women’s Oral History*. “Our ridiculously starched skirts and hobbling sheaths were a caricature of femininity. Our cinched waists and aggressively pointed breasts advertised our availability at the same time they warned of our impregnability.” Nursing and teaching were the only professions easily accessible to women. A woman’s role in life was to be married and raise children, and to start at an early age. She was supposed to find satisfaction in serving her husband and her children. If she had desires of her own—be they sexual, professional, or personal—she was expected to hold them in check, to wipe them out the same way she wiped germs from the kitchen counter or stains from the collars of her husband’s white dress shirts. To rebel against these restrictions was to invite scorn and humiliation. The unmarried life was seen as empty and joyless, and women living it were to be pitied.

Women in the 1950s tended to marry as soon as they could. The median age of marriage for a woman in 1950 was 20.3. A decade earlier, the median age had been 21.5 (today it is 26.1). Why were young women of the 1950s in such a hurry to get hitched? With the war over and men returning home, single women had few options. They couldn’t compete with the men for jobs, and college, while potentially enlightening, only postponed the realization that career options for women were limited. “What’s college?” asked an ad for Gimbels department store. “That’s where girls who are above cooking and sewing go to meet a man so they can spend their lives cooking and sewing.” Another reason to marry: They wanted to have sex, and it was dangerous to do so out of wedlock. Condoms were sold in drug stores, but to get a diaphragm in most states required a doctor’s prescription, and most unmarried women were ashamed to ask.

“I knew birth control existed, but I didn’t know anything about it,” one woman told Harvey for her oral history. “To go out and actually get it [birth control] would mean that I planned to do these things, to

have sex. Since I knew it was wrong, I kept thinking I wasn't doing it, or I wasn't going to do it again. Each time was the last time. Birth control would have been cold-blooded."

"I was terribly frightened about getting pregnant," another woman admitted, "but I never did anything about getting birth control. I'm not really sure why. Maybe I kept telling myself we weren't going to do it again."

Soon, of course, the young brides as well as the brazen few who engaged in premarital sex did get pregnant. Not just once but over and over again. As the Baby Boom began and families grew, women raising four, five, or six children began seeking more effective means of contraception. Women who married at nineteen or twenty were done—or wished to be done—with babies by the time they were thirty. Most American women, with the exception of Catholics, accepted the idea of birth control, and most of them wished for a more convenient and effective method.

Fear of pregnancy was an unavoidable part of sex for young women in the 1950s. A woman who was unmarried and pregnant was in terrible trouble. Single motherhood was not an option, at least not among the middle and upper classes. Abortion was illegal and underground abortions could be dangerous or difficult to obtain, especially for those without money. Many women felt trapped—by their bodies, by their career options, by their contraceptive options, by pregnancy, and perhaps most of all by their limited choices.

That's why Margaret Sanger was so interested in meeting with Gregory Pincus. She was seventy-one years old, well past her sexual prime, and had lost some of her brazenness. Instead of fighting for sexual liberation, she employed more pragmatic arguments, touting the importance of population control and family planning.

She had long held that it was not a question of principle but a question of methods. If the right method of birth control were discovered, she believed, the sex—and everything else—would take care of itself.

Spontaneous Ovulations

THE RABBITS WERE kept in the basement of the Worcester Foundation, along with the rest of the animals, so that their smell wouldn't stick to everyone and everything. Using a small eyedropper, Chang began feeding the animals small amounts of liquid progesterone—between two and five thousandths of a gram.

Chang was tan and slender with thick black hair that he oiled and combed back from his brow. When he smiled, which he often did, a crooked front tooth protruded; otherwise, he was as handsome as a Hollywood leading man, if Hollywood in the 1950s had had Chinese leading men. In China, Chang had won a national competition to earn the right to study abroad. He chose the University of Edinburgh, where he majored in agricultural science and took particular interest in sheep sperm. In part because he spoke English so poorly and in part because it was his nature, Chang came to believe that the key to success was working harder than anyone around. The fact that he was smarter than almost anyone around didn't hurt, either.

Chang spent seemingly endless hours in the laboratory, never complaining. But in truth he did not care much for the progesterone work. Every time an animal was tested it had to be killed and cut open to see if any eggs had been released. It was grisly and inefficient,

but Chang refused to delegate the work to an assistant. "I like to feel the experiments through my hands," he once said. "Would you let someone else play tennis or chess for you?"

The initial results, recorded in the spring and summer of 1951, were as he and Pincus had expected. The animals receiving progesterone did not appear to ovulate.

"Victory!" shouted Chang.

Next, Chang tried inserting the hormone in the rabbits' vaginas. That worked, too, although not as well. Larger doses were required, and the progesterone stopped doing its job after about five hours. After the vaginal tests, Chang tried pellets lodged under the rabbits' skin. This time, a single pellet prevented ovulation for months.

Pincus was pleased, but he wasn't finished. Rabbits are not like humans; female rabbits have to copulate to release eggs. So Pincus told Chang to move on to rats, which, like humans, ovulate spontaneously. Rats offered another benefit for research purposes: they're sexually prolific. When a female rat is receptive, she can mate as many as five hundred times with various males in a span of six hours.

Chang caged male and female rats together, two males to every five or six females, and injected some of the females with progesterone. Once again, the experiment worked; there were no pregnant rats. And once again, larger doses had longer lasting effects.

Pincus and Chang ran tests through the night and into the early morning in their first weeks and months experimenting with progesterone, hoping that a solid report to Planned Parenthood might get them more money. Sometimes church groups or Rotary Club members would visit the Foundation to see what kind of work went on. The Foundation was funded in large part by its neighbors, after all, and so Pincus made it a point to welcome tours.

Visitors might find Goody Pincus weighing a female rat's uterus, castrating male rats, or seated behind his desk smoking Viceroy's and looking over the budget. He seldom smiled and almost never laughed,

but he had an easygoing way that put people at ease. If his visitors ventured into the basement they would see dozens of rabbits and rats, although they probably wouldn't see them having sex because the animals were shy around humans. Pincus enjoyed explaining science to the uninformed. Moreover, he deemed it part of his job. Margaret Sanger wanted a pill, but Pincus was not embarking on this project simply to satisfy a client. He took himself too seriously as a scientist to do straight work for hire. "The modern-day investigator," he once wrote, "cannot be satisfied with the invention of a 'cunning device.'" Tinkering with the reproductive process could be dangerous. A misstep at any point in the process could cause lasting and profound "physiological consequences that are not apparent on the surface." The researcher, he said, must first understand as much of the process as possible, and then he must work to explain that process to others. He mocked as naïve the "ivory tower conception of research" that says a scientist should do his research, publish his results, and wash his hands of the matter. The modern world required a different, more activist brand of science, he said. It would not be enough merely to create a more effective contraceptive. If such a thing were to work, the scientist leading the research would have to make sure doctors, nurses, clinicians, and patients understood the how and why of it. He would have to be an evangelist. He would have to see that the contraceptive was properly used, just as the physicists who worked on the atomic bomb had done. They didn't hand off their bomb and move on; they formed safety committees and promoted dialogue about the weapon's future use. Pincus couldn't understand why physiological researchers weren't more engaged with the world in which they lived.



In the 1930s and even the 1940s, contraception was controversial and hormone research was in its primitive stages. But by the time Pincus and Chang came along, the world was changing. Many politi-

cians, journalists, intellectuals, and social activists viewed population growth as a threat to economic development and world peace. Between 1920 and 1950, poor countries had been growing much more rapidly than prosperous ones. There was a growing sense among activists and intellectuals—a sense often informed by racism, arrogance, and politics as well as genuine concern—that high birth rates in poor countries would devastate the world. Poverty and starvation would spread; the diseased and deficient would multiply; and overpopulated nations, in desperation, might tip to communism. In 1927, a Rockefeller Foundation–funded study of contraception sought “some simple measure which will be available for the wife of the slum-dweller, the peasant, or the coolie, though dull of mind.” In language that was widely accepted at the time, some argued that governments should subsidize the sterilization of the feeble-minded as well as people with communicable diseases.

In 1932, the novelist Evelyn Waugh warned in his book *Black Mischief* that finding solutions to population growth would not be as simple as crusaders like Sanger hoped. The novel’s hero, an English playboy living on a tropical island, designed a poster meant to discourage couples from producing big families. The poster displayed two scenes: in one, a family with eleven children manifested signs of disease and malnutrition; in the other, a husband and wife with one child lived in affluence. Between the two pictures was the image of a contraceptive device and the legend “Which home do you choose?” The islanders in Waugh’s book chose the larger family and concluded that the device in the middle—“the Emperor’s juju”—was responsible for the unfortunate condition of the couple that had only one child.

Changing such attitudes would never be easy. Sanger supported economic development and education. At the same time, for all her tireless efforts as a champion of women, she could be shockingly insensitive, too. She agreed with the eugenicists who said that women not qualified to be mothers ought to be sterilized. But sterilization,

education, and economic development were not enough. She sought a solution that would do it all—reduce population size, restrict reproduction among unfit parents, and make sex more fun, and she had come to believe that only a truly scientific contraceptive would do. A scientific solution would give her the legitimacy she needed to make a broad and lasting impact.

If Sanger had approached Pincus with the idea of developing a pill solely to allow women more pleasure in sex, it's unlikely that he or any other male scientist would have risked his reputation on it. But now he had a chance to create a simple solution to many of the world's most daunting problems. These were Sanger's longtime concerns, not his, but he could see the potential. When he began, he was interested primarily in the science, but he quickly understood the social change a birth-control pill could effect. "Our globe is facing a threat that could be far more serious than the atomic bomb," he told one journalist. Birth control struck him as an issue big enough to bring him the fame and respect he believed he was due.



The Worcester Foundation, with about twenty scientists, operated on an annual budget of \$300,000. Residents contributed about \$63,000 of that amount. Forty miles west of Boston, Worcester had a population of 208,000. It was a booming factory town in which about six hundred and fifty companies employed nearly fifty thousand men and women in the manufacture of steel, wire, machine tools, grinding wheels, coiled springs, carpets and rugs, corsets, shoes, envelopes, leather goods, woolens, skates, automobile parts, firearms, boilers, sprinkler systems, wrenches, crankshafts, wool-spinning machines, and electric clocks. The city had more than thirty hotels, ten theaters, two daily newspapers, and a prestigious art museum containing important works by Renoir, Monet, and Gauguin. Worcester residents were proud to live in one of the biggest manufacturing cities

in the country not located on a waterway. They were also proud, thanks to Pincus and Hoagland, to have their own scientific foundation, which they supported in much the same way they supported the local Boys Club. One year, supporters of the Foundation sponsored a barbershop quartet concert at Mechanics Hall that raised five hundred dollars. Pincus and other Foundation leaders gave dozens of lectures each year to community groups and social clubs. Local businesses like the Wear-Well Trousers Co. and the Worcester Baking Company pitched in with donations. But as the Foundation grew and as support for scientific research expanded in the years after the war, community support was eclipsed by government grants and drug company contracts.

Pincus and Hoagland were fortunate to launch the Worcester Foundation at a time of enormous growth in the pharmaceutical industry. The catalyst was the discovery in the 1930s of the first commercially available antibacterial drugs, known as sulfas, followed by the introduction of penicillin as a drug in the early 1940s. By the late 1940s and early 1950s, drug makers like G. D. Searle & Co. were no longer content to manufacture familiar products; they were competing fiercely to discover and market new ones. In the late 1940s, Searle, a small pharmaceutical company based in Skokie, Illinois, and other drug companies were looking for a way to synthesize cortisone, which had recently been demonstrated to relieve arthritis pain. Pincus persuaded the drug company that he could synthesize cortisone by pumping serum through the adrenal gland of sows—a method referred to as perfusion—and spent half a million dollars of Searle's money trying to prove it. But before Searle could make use of Pincus's new technology, which was effective up to a point, researchers at the Upjohn Company in Kalamazoo, Michigan, found a simpler and cheaper way to do the job.

In the fall of 1951, hoping to repair the relationship with Searle and secure their help on Margaret Sanger's progesterone project, Pin-

cus went to Skokie to meet with Albert L. Raymond, the drug company's director of research. Raymond, a small, studious man with a thin, red mustache, told Pincus that his most important benefactor was losing faith. Though Sanger and Planned Parenthood had invited Pincus to work on a new contraceptive, the money for that project was paltry and might dry up at any moment. He needed Searle. Yet his meeting with Raymond did not go well. When it ended, he was so rattled that he grabbed several sheets of hotel stationery and wrote Raymond a frantic letter.

"Since sleep escapes me," he began, "I will try to set down what I think is a fair summary of what you said to-night as we were driving around. You said: 'You haven't given us a thing to justify the half-million that we invested in you . . . and the responsibility for this failure is yours. . . . To date your record as a contributor to the commerce of the Searle Company is a lamentable failure, replete with false leads, poor judgments, and assurances from you that were false. Yet you have the nerve to ask for more.'" After summarizing Raymond's comments, Pincus framed his response, one that was both professionally and personally close to groveling, revealing a kind of doubt and desperation he almost never permitted anyone to see. "I feel that the moral is plain," he wrote. "There should be, from a business point of view, no need for further support of a person with such a record."

Pincus had not merely tried and failed, he had tried hard and failed badly. The loss of Searle's support would be a huge blow to the Worcester Foundation. Already he was having a difficult time paying workers what they were worth. Only loyalty and love of the work kept his top scientists from taking better jobs. Now it was possible that he would have to dismiss workers or encourage them to take jobs elsewhere. For Pincus personally, the failure was profound, leaving him to wonder if he would ever achieve the greatness of which he believed he was capable and if the Worcester Foundation's days were numbered.

“I want you to know,” he wrote to Raymond, “that I have indeed been embarrassed at the failure to see a paying result. I have done what I could, but it is obviously in your view no good. My attempts have led me into a situation which is rather difficult. . . . [N]ow at a time when I am just about at the peak of productive activity I see my wife buying \$6.95 dresses the way she did when we were first married . . . and if I were to die I would leave my family not too well provided for.”

The letter is neither an apology nor a plea for forgiveness. It reads, instead, like the work of a passionate scientist, one who has analyzed the data carefully in an attempt to explain his own failure and its consequences. Given his uncertain status with Searle, it was no wonder Pincus would be reluctant to turn down Margaret Sanger’s “ludicrous” offer of \$2,000 to fund birth-control research. He was in no position to turn down anything.