Facts and ideas from anywhere

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THE MOST IMPORTANT MEDICAL EVENTS OF THE 20TH CENTURY

At Christmas, a friend gave me the book *The 365 Most Important Events of the Twentieth Century* (1), written by Paul Baldwin. Included among the 365 most important events were 24 having to do with medicine. They were as follows:

1. 1902, William Bayliss and Ernest Starling of Great Britain discovered the existence and function of hormones. The word "hormone" is derived from a Greek root that means "setting in motion."
2. 1904, yellow fever was controlled. The building of the Panama Canal began in 1904, and from the start workers in large numbers contracted yellow fever, which in many cases resulted in coma and death. The US surgeon general, William Crawford Gorgas, was sent to deal with the problem. Because he had survived yellow fever himself, he was immune to it. His efforts were successful in eventually controlling both yellow fever and malaria, also carried by mosquitoes.
3. 1905, the German surgeon H. F. W. Braun developed novocaine, which rapidly became the most widely used painkiller in dentistry. Its ability to blot out pain, if not the noise of the drill, encouraged the idea of regular dental checkups.
4. 1909, Sigmund Freud visited the USA.
5. 1910, Marie Curie isolated radium.
6. 1916, Margaret Higgins Sanger opened the first birth control clinic in Brooklyn. By 1925, the former nurse had become world famous.
7. 1918, the flu epidemic killed >21 million people worldwide, including 12.5 million in India and >500,000 in the USA.
8. 1920, the bubonic plague struck India, killing at least 2 million people.
9. 1935, Frederic Joliot and Irene Curie, who at marriage took each other's names to become Joliot-Curie, received the Nobel Prize in chemistry for their work in the production of radioactive substances through bombardment by alpha particles.
10. 1940, Dr. Richard Charles Drew founded the blood bank in New York City. Dr. Drew himself was forbidden to donate blood there because he was black.
11. 1941, Howard Florey and Ernst Chain produced penicillin in large quantities. Penicillin was discovered in 1928 by Alexander Fleming and was mass produced about 10 years later.
12. 1946, Dr. Benjamin Spock's *Common Sense Book of Baby and Child Care* appeared and became the bible of American child care for decades. By the time Benjamin Spock died in 1998, >50 million copies of various editions of his baby care book had been sold around the world.
13. 1950, Dr. Richard H. Lawle performed the first organ transplant (kidney) in Chicago, Illinois.
14. 1953, Dewey Watson (USA) and Francis Crick (Great Britain) uncovered the double helix structure of DNA, the principal component of the chromosomes that determine our heredity.
15. 1953, a woman was successfully impregnated with frozen sperm. This event was followed later by the introduction of sperm banks.
16. 1954, Jonas Edward Salk developed the polio vaccine, a killed-virus vaccine administered by injection. Five years later, a live-virus vaccine was developed for oral administration.
17. 1954, a report indicating that cigarettes caused cancer was published.
18. 1960, the first laser (Light Amplification by Stimulated Emission of Radiation) appeared.
19. 1967, Christiaan Barnard performed the first heart transplant in South Africa. The recipient lived 18 days.
20. 1980, the US Supreme Court ruled that a microbe created by genetic engineering could be patented. The ruling opened the way to greatly increased research in genetic engineering, since the ability to patent the results of such work could ensure eventual profits from it.
21. 1981, Italian voters approved abortion. This development was an enormous embarrassment to the Vatican, which had found itself unable to defeat the pro-choice forces even in its own backyard.
22. 1981, AIDS was officially recognized and discovered to be due to a virus called HIV.
23. 1990, surgery on an unborn child was performed within its mother's womb in London, United Kingdom.
24. 1997, an adult sheep was cloned in Edinburgh, Scotland, producing a genetic copy named "Dolly."

SHINGLES

An estimated 1,000,000 Americans develop shingles every year (2). Most are >50 years of age, and many suffer months of incapacitating pain. Shingles is caused by the same virus that causes chickenpox (varicella-zoster virus). Until recently, just as the fever and itchy blisters of chickenpox were an inevitable part of childhood, shingles was considered an unavoidable risk of old

age, impossible to predict or prevent and often accompanied by pain notoriously difficult to control.

When children catch chickenpox, their rash scabs over within a week or so and heals, but the virus does not leave the body. It retreats from the skin back to large clusters of nerve cells that lie on either side of the spinal cord. There it lies dormant, kept in check by the body's immune system. If something goes wrong with the immune system years later, such as cancer or AIDS or something as subtle as the normal changes in immunity that occur with aging, the chickenpox virus can reactivate in a cluster of nerve cells and begin to reproduce again, heading back out along delicate branching filaments of the nerves to the skin. Once back in the skin, the virus causes exactly the same kind of blisters as it did during chickenpox, but only in the patch of skin where the nerves with the virus have endings.

For unknown reasons, the varicella virus prefers to hibernate in the nerves that transmit pain and other sensations from the skin to the spinal cord, where a second relay of nerves then transfers the information to the brain for processing. As the virus reactivates these nerves, it can interfere with their normal functioning.

Unless shingles is on the face and affects the eye, the rash usually goes away after several weeks without complications. But about 50% of people >60 years of age have persistent pain in the area that lasts long after shingles has faded. The reactivation of the varicella virus in nerves that control pain and sensation often winds up destroying those nerves. Patients with severe postshingles pain may have lost $\geq 80\%$ of sensory nerve endings in the affected skin. The loss of so many nerves may cause electrical chaos in the spinal cord that is interpreted by the brain as overwhelming pain. Other nerves in the skin that normally transmit sensations of temperature or pressure, but not pain, can become confused after an episode of shingles and start to transmit pain too. As a result, patients with postshingles pain find the light touch of bedclothes, and even the touch of clothing, excruciating.

The pain of shingles is rarely responsive to aspirin or nonsteroidal anti-inflammatory drugs. Lidocaine patches may be helpful. Antidepressant drugs and antiseizure drugs are sometimes useful. Codeine and morphine may help, but they seldom abolish the pain entirely.

New hope is on the horizon, and it is the chickenpox vaccine, which was licensed for use in the USA in 1995. It is already reducing cases of chickenpox in some communities by as much as 90%. The vaccine contains a weakened strain of the chickenpox virus that is strong enough to boost older adults' waning immunity against the chickenpox virus. When adults who receive the vaccine develop shingles, they appear to have notably mild cases, without protracted pain.

A study is now under way to test the chickenpox vaccine in men and women >60 years who had chickenpox as children. Of the 37,000 volunteers to be enrolled from sites across the USA, half will be given the chickenpox vaccine and half a placebo vaccine, and the rates of shingles and pain will be monitored in both groups. A toll-free phone number (1-877-841-6251) will direct those interested in participating to the nearest enrollment center.

EFFECT OF EACH CIGARETTE ON LIFE EXPECTANCY

Dr. Mike Ramsay recently called my attention to a piece by Shaw and colleagues (3) from Bristol, United Kingdom. These investigators, using previously published data of 34,000 male physicians >40 years of age, found a difference in life expectancy between smokers and nonsmokers of 6.5 years. They calculated that a man who smoked the average number of cigarettes a year (5772) from the median starting age of 17 until death at age 61 would consume 311,688 cigarettes in his lifetime. Each cigarette would then cost him, on average, 11 minutes of life: $6.5 \text{ years} = 2374 \text{ days or } 56,976 \text{ hours or } 3,418,560 \text{ minutes}$; $5772 \text{ cigarettes per year for } 44 \text{ years} = 311,688 \text{ cigarettes}$; and $3,418,560 \text{ divided by } 311,688 \text{ equals } 11 \text{ minutes per cigarette}$.

Health and cigarettes are simply incompatible. The nonsmokers are paying a good percentage of the smokers' health bills, and that's unfair.

THINK OF LEXINGTON AND DAKOTA CITY, NEBRASKA, WHEN EATING BOVINE MUSCLE

Lexington, Nebraska, is a town of approximately 10,000 persons and the location of the world's largest meatpacker, IBP (formerly Iowa Beef Packers), which kills 1 head of cattle every 11 seconds (4). IBP employs 2300 workers, or one quarter of Lexington's population, and exports prime beef worldwide. The stench of burning blood, bristle, and bone lingers in the western Nebraska air, and the invisible toxic cloud burns the residents' throats and leaves a bitter taste on their lips. The dead, heavy, nauseating smell is hydrogen sulfide, a byproduct of organic decay in cattle feed lots, the city's sewer system, and IBP's slaughterhouse. Hydrogen sulfide corrodes the lungs and starves the brain of oxygen. The toxicity of hydrogen sulfide was first identified in the deaths of mid-19th century sewer workers in Paris and London.

In Dakota City, Nebraska, where IBP also does business, the Justice Department recently filed a lawsuit accusing IBP of violating federal air, water, and hazardous waste laws at the company's flagship plant and former headquarters. IBP apparently emitted up to 1800 pounds of hydrogen sulfide a day in Dakota City without notifying federal regulators. (Disclosure is required for hydrogen sulfide emissions >100 pounds a day.)

IBP is the largest cow slaughterer in the world, with 40% of the US market. It also is the number 2 hog slaughterer (after Smithfield Foods). It has 53 plants in North America and 45,000 employees. Its major customers are Burger King, Morton's of Chicago, Pizza Hut, Godfather Pizza, Honey Baked Hams, and most grocery chains. It produces about 3000 different products, including deli meats, frozen appetizers and entrees, and pizza toppings and crusts; raw materials for pet food and animal feed; gelatin for food products and photographic film; leather hides for clothing, car seats, purses, and furniture; tallow for cosmetics, paint, glue, shortening, and soap; and pharmaceutical products. Few people who eat the steaks smell the stench, unfortunately.

THE WORST NATURAL DISASTER IN HISTORY

It happened in December 1999, on the Caribbean coast of Venezuela (5). The death toll reached 20,000, twice the number killed in 1998 when Hurricane Mitch hit Central America. An estimated 35,000 homes were destroyed, and more than 150,000 people were left homeless when torrential rains soaked the area's

deforested terrain. Massive mudslides and flooding caused the destruction of life and property.

EUROPEAN WINDS DEVASTATE FORESTS

Aside from killing >130 people, 87 of them in France, 2 freak storms whipped across western Europe in December 1999, destroying >270 million trees in France, or about 50 million cubic yards of wood (6). That's enough to build 1.3 million average-sized American homes. It could take a century for forests to recover fully. The winds reached peaks of 125 miles per hour. Among the destroyed trees were 10,000 in the 330-year-old Château of Versailles gardens and park, which draw >10 million visitors a year. In Paris, hundreds of trees along avenues snapped or were wrenched whole from the sidewalks. Thousands of buildings were damaged, including centuries-old monuments such as Notre Dame in Paris and 935 public schools. About 300,000 households in France were without electricity or heat for long periods. It is amazing that more people were not killed.

NATURESPORT

The same people who brought the Marquis de Sade, the guilotine, and the Peugeot also devised the most sadistic athletic event on earth, the *Raid Gauloises* (7). It has been an annual event since 1989. The first Raid Gauloises included 26 teams, which raced 300 miles across New Zealand's mountainous South Island, setting a new standard for physical torture in the name of sport. The winning team made it across in 5 days, 21 hours, and 15 minutes. The 1998 race was the scaling of the 19,347-foot Mount Cotopaxi in Ecuador, one of the highest active volcanoes. The April 2000 race will be a 300-mile trek beginning in Tibet across the Himalayas to northern India. I'm not sure that "sport" has to be such torture.

SEX ON TELEVISION

Dr. Dale Kunkel of the University of California recently conducted a study for the Kaiser Family Foundation, in which more than 1300 television shows from the 1997 to 1998 season were randomly selected and analyzed for sexual content (8). With the exception of newscasts, sports, and children's programming, 56% of all television shows either talked about sex or portrayed sexual behavior, while 67% of all network prime-time shows contained sexual content, averaging >5 sexual scenes per hour, which adds up to essentially 1 sex scene for every 12 minutes of viewing.

SEXUAL DESIRE AFTER HYSTERECTOMY

Contrary to popular belief, women's sex lives tend to improve after hysterectomy. In the largest study of its kind, 1300 Maryland women were interviewed before having a hysterectomy and then 3, 6, 12, 18, and 24 months afterwards (9). They had surgery for the treatment of noncancerous conditions, such as uterine fibroids and bleeding. After hysterectomy, the number of women having sexual relations at least 5 times a month increased by 10%. Furthermore, orgasms were more frequent and stronger, there was less pain during sex, and desire increased. Ironically, some of the women had put off the operation for years, fearing that removal of the uterus would diminish their sex lives. This is all good news because about 600,000 hysterectomies are performed annually in the USA.

EFFECT OF LATE-NIGHT SHIFTS ON MARRIAGE

If Mom or Dad works the midnight-to-8 AM shift, the risk of divorce increases significantly compared with couples in which both parents work daytime hours (10). The risk of divorce is 6 times greater for couples married <5 years and 3 times greater for couples married >5 years. For one spouse to work nights clearly adds extra stress to a marriage. Factors at play might include sleep deprivation, the impact on the family's social life, and lack of time alone as a couple. This 5-year study by Harriet Presser involved 3475 married couples and was the first to examine what working late-night hours does to the stability of marriages. The findings don't hold up for couples without children who work similar hours. It turns out that only 55% of employed men and women regularly work a standard 35- to 40-hour workweek Monday through Friday on a fixed daytime schedule. The rest work nonstandard schedules. Two fifths of all employed Americans work mostly evenings or nights on rotating shifts and/or weekends.

ALZHEIMER'S DISEASE AND MARRIAGE

Researchers in France followed up on 2881 people over 5 years and found that those who had never married were 3 times more likely to develop Alzheimer's disease than those who were married (11). The protection continued even after the death of a spouse.

EFFECT OF COHABITATION ON SUCCESS OF MARRIAGE

The Marriage Project at Rutgers University recently reported that more than half of all marriages in the USA are now preceded by cohabitation with the significant other. This premarital "trial arrangement," however, is proving to be a lousy test for the success of the marriage (12). Couples who live together before marriage, the Rutgers project reported, are far more likely to divorce than couples who do not. That is partly because cohabitation does not test the most important thing one needs to know about a prospective spouse: whether this person can be trusted to be there when times are really tough. Instead, by its very nature, cohabitation raises doubts about dependability, for cohabitation is a make-no-lasting-promises sort of relationship. It asks for the privilege of married life—a shared bed, a shared residence, a shared life—without commitment to do the hard work that makes for genuine love. Another unfortunate part about this, especially for those young people whose lives already have been ripped apart by their parents' divorce, is that just because the law distinguishes between the breakup of a marriage and the breakup of a cohabiting relationship doesn't mean the heart respects such distinctions. Indeed, many cohabitants have found that "dumping the significant other" (or being dumped) can be as emotionally wrenching as going through a divorce.

So how can a person in our romantically chaotic times safely test whether a person of the opposite sex is trustworthy enough to marry? William Mattox, Jr., suggests reading the book *Wing to Wing, Oar to Oar* by University of Chicago professors Amy and Leon Kass. The Kasses teach a popular course that exposes students to a rich treasure trove of great writings on love and marriage, including stories by Homer, Shakespeare, Moses, and Jane Austen, and philosophical reflections by Plato, Erasmus, C. S. Lewis, and Thomas Aquinas. Their anthology is intended to help

young people of marriageable age and their parents think about the meaning, purpose, and virtues of marriage, and, especially, about finding the right person with whom to make a life.

DIVORCED POPULATION RISES

In 1900, the US population was approximately 130,000,000, and about 200,000 were divorced (13). In 2000, the US population is 273,000,000 and nearly 20,000,000 are divorced, a 100-fold increase in 100 years.

FATAL LOVE

In a 48-hour period, Kathleen, aged 19, Marie, aged 39, and Joy, aged 18, were targets of homicidal attacks by men with whom they had had romantic relationships (14). Two died immediately, and the third lived only because her former boyfriend's pistol jammed. In all 3 cases, the men believed responsible for the attacks committed suicide shortly afterwards.

This type of crime is commonplace. According to homicide statistics collected by the Federal Bureau of Investigation, 32% of the 3419 women killed in the USA in 1998, the latest year for which data are available, died at the hands of a husband, a former husband, a boyfriend, or a former boyfriend. Many experts, however, believe that the true figure is much higher, perhaps as much as 50% to 70%. In comparison, 4% of 10,606 male homicide victims in 1998 were killed by current or former intimate partners.

Why are men so much more likely than women to kill their partners? Feminist scholars and domestic violence experts have long contended that such crimes reflect a society in which men feel entitled to exercise power and control over women and to use physical violence, when necessary, to assert their dominance. Some evolutionary psychologists also argue that men, as a whole, rather than individual men, are the problem. They base this assertion not on culture but on biology. Violence, they believe, may have developed as a strategy for men to exert proprietary control over women, and in particular over their reproductive capacities. Other psychologists focus on the personality characteristics and life histories that lead men to batter and kill. At any rate, social scientists in recent years have begun to investigate homicides by intimate partners in a much more systematic way, hoping to find ways to spot the potential for lethal violence before it occurs and to develop better tactics for intervention.

Many studies confirm that women are at particular risk when they are in the process of leaving a relationship. In a study of 293 women killed by intimates in North Carolina from 1991 to 1993, 42% had been killed after they threatened separation, tried to separate, or recently separated from their partners. In another study of 551 intimate partner homicides in Ontario, 32% were committed in the context of a separation, and in another 11% the killer believed that the female partner was sexually unfaithful. In a review of homicides in Chicago, 50% of the killings of wives by their husbands took place within 2 months of a separation, and 85% occurred within a year.

In a study of 50 men in prison for killing their wives in British Columbia, the investigating psychologists found that typically the murder was overkill—more was done to the woman than was necessary to kill her. Of 379 women known to have been killed by male intimates in New York from 1990 to 1997, 47% were killed with guns, 27% were stabbed, 8% were bludgeoned, 8%

were strangled, and 11% were killed by other means including suffocation and being pushed from a window or the top of a building. That women killed by male partners are more likely to be stabbed or strangled than those killed by someone less close to them reflects the emotional nature of the crime. Stabbing or strangling someone to death is a lot more intimate than shooting them.

The biggest risk factor found so far from the study of completed and attempted murders of women by intimate partners in 11 large and midsized cities was previous assault by their partner: of the 250 women killed by current or former partners, 65% had been assaulted by their partners in the past; of the 200 victims of attempted homicide, 72% had experienced a previous assault. Past stalking of the woman by her male partner also posed a significant risk, occurring in 69% of homicides and 84% of attempted homicides. When the woman had separated from her partner, the frequency of stalking rose to 88%. In many cases stalking occurred even when the couple lived together. A man, for example, might show up unexpectedly at his partner's workplace, beep her repeatedly on a pager and demand to know where she is, or call her dozens of times a day. Other predictors of lethal violence included an escalation in the frequency or severity of physical abuse, attempts by the man to choke the woman or to force her to have sex, the presence of a gun in the house, the use of street drugs or the abuse of alcohol by the man, verbal threats, and the woman's belief that her partner was capable of killing her.

A history of domestic violence is found less often in men who kill themselves after killing their partners: only about 25% of men who kill their partners commit suicide afterward. Curiously, in the multicenter study, men who tortured or killed animals—long thought to be a sign of potential danger—were not more likely to kill their partners. This all makes me think of the O. J. Simpson case.

ROBERT SWANSON AND GENENTECH

In December 1999, Robert Swanson, a cofounder of Genentech, died at age 52 from brain cancer (15). In January 1976, Swanson, then a 28-year-old venture capitalist, drove from Silicon Valley to the University of California at San Francisco to meet with Herbert Boyer, a biochemist and one of the inventors of recombinant DNA. The discussion, planned for only 10 minutes, adjourned to a local pub for several hours, and Genentech was born. This meeting produced a new structure for science-driven business and fundamentally changed the relation between business and research universities in the USA. Before Swanson made that trip, the best university research scientists would not consider joining industry, believing that their academic careers would be ruined if they did. Universities, with their basic research laboratories, and corporations, with their focus on product-driven development, passed like ships in the night. While universities published research papers, secrecy was the rule in industrial research.

In the mid-1970s, a structure to help new companies commercialize technology was evolving in Silicon Valley. But, the small community of venture-capital firms was focused entirely on electronics. At about the same time, Boyer at the University of California at San Francisco and Stanley Cohen at Stanford had succeeded in making a gene from one organism function suc-

cessfully in a different kind of organism. Recombinant DNA was the province of a small group of academic scientists and the subject of a lively ethical debate, with no commercial interest whatsoever. A lone university administrator persuaded the scientists to file a patent application.

Swanson, with degrees in chemistry and management from the Massachusetts Institute of Technology, wondered whether new organisms could be created to help discover and produce pharmaceutical proteins. Swanson would have to start a company, hire the best research talent, and win over skeptical investors. This was the 1970s, and gene splicing was not electronics. The most creative researchers had little interest in working for business, and there was no model for a start-up company based on biology. Research and product approvals would take years. Swanson would have to invent an entirely new kind of company.

Swanson became chief executive officer of Genentech and set out to create an organization that the best scientists would want to join. The quality of their science was paramount; they could publish as much, and as often, as they wished. Genentech developed its own products and retained the commercial rights. Unlike the pharmaceutical industry, Genentech protected those rights through patents, not secrecy. Swanson pioneered the use of research and development partnerships to help fund the research. Through stock options the scientists would share in the success of their work.

Swanson had an unpretentious style that fit perfectly with freewheeling scientists. He did not have an executive parking spot. Genentech's Friday afternoon parties would have made pharmaceutical executives blanch, but these activities delighted the employees.

Within a few years, Genentech had succeeded dramatically. A flood of new companies followed its path. Swanson's eye for talent produced a remarkable alumni group whose members now lead many of the next generation biotech companies. Investors and the public were transfixed. Fifteen years before the Internet frenzy began, Genentech's initial public offering in October 1980 was the most successful in history. The stock opened at \$35 a share and reached as high as \$88 on the first day of trading.

Because pharmaceutical product development takes enormous resources, in 1990 Genentech announced that Roche Pharmaceuticals would buy a controlling interest for \$2.1 billion. But Swanson stayed on as chairman until he resigned from the Genentech board in 1996.

In the quadrangle of the new research complex at Genentech, there is a life-sized metal sculpture of 2 men sitting at a table, each with a beer. One is Bob Swanson dressed in a suit. He is leaning forward enthusiastically making his point. The other is Herb Boyer, the counterculture university scientist in denim vest and bell-bottom jeans. He is leaning back, skeptical but intrigued. He is on the verge of deciding to cast his fate with the young venture capitalist. It is a fitting memorial to the moment of the founding of Genentech, the biotech industry, and a new approach to the business of science.

TOM LANDRY

He died at Baylor University Medical Center at age 75 on February 12, 2000. The country remembers him most vividly standing on the sidelines, coatless even in subfreezing weather,

immaculately dressed in suit and tie and wearing his trademark porkpie hat (16, 17). Over the years the stone face became a trademark as his winning Dallas Cowboys (2 Superbowl championships) became "America's Team" through Landry's no-nonsense, workaholic methods enhanced by his strong beliefs in self-sacrifice and Jesus Christ. A former bomber pilot, Landry well knew that if one of the pilots flew just a little bit out of formation, the rest of the squadron could face disaster. He coached using the same philosophy. Landry considered every eventuality and prepared his players accordingly. He demanded that pass routes be run with exactness. With Landry, there was no room for flamboyance, individuality, or straying from the established plan. He called every play during his coaching career in Dallas. He coached the Cowboys from 1960 until 1989 when he was let go by the new owner with never so much as a thank you, in the same cold manner he had discharged a generation of players who had outlived their usefulness. Old Stone Face, who was born and raised in Mission, Texas, fulfilled his mission.

CHARLES SCHULZ AND "PEANUTS"

Charles Schulz, aged 77, died from cancer in his sleep on February 18, 2000, just as the last "Peanuts" cartoon was loaded onto the last trucks for the last home delivery (18, 19). His life and his work were completed on the same day. For 50 years, Mr. Schulz was the scriptwriter, producer, and director for a repertory company of small imaginary characters who never changed. He penned more than 18,250 strips. He drew them when his hands were strong and his line was sure, and he drew them when a tremor made it hard to hold the pen. Long after his income had topped \$30 million a year, he got up every morning, drove to breakfast and then to his studio at One Snoopy Place, worked, went out for lunch, and came back to work. Only once, under orders, did he take off for >10 days.

Charles Schulz was much more than a cartoonist; he was a philosopher. He knew life is not always fair, but it still can be fun. He and his "Peanuts" gang took life very seriously but never took themselves too seriously. "Peanuts" wasn't about failure, it was about perseverance. Charlie Brown always missed the football and always got his kites stuck in trees. Linus always sucked his thumb and carried his comfort blanket. Snoopy was a sleepy-eyed beagle who dozed at the typewriter. Lucy's curbside psychiatric clinic didn't offer a nickel's worth of good advice. That's life. He made kids of all ages laugh. I hope the cartoon characters made Charles Schulz smile as much as he made the rest of us smile.

DR. JOSE GUERREROSANTOS AND AN INSTITUTE FOR RECONSTRUCTIVE SURGERY

On January 29, 2000, I spoke at a meeting of the Western Chapter of the Mexican Academy of Surgery in Guadalajara, Mexico. I had been invited by Dr. Jose Guerrerosantos, president of the Western Chapter, whom I had met in Hermosillo, Mexico, several months earlier. The meeting was held at the Institute for Reconstructive Surgery of Jalisco, the state where Guadalajara is located. I learned that this is probably the only hospital in the world devoted exclusively to plastic surgery. Approximately 30 years earlier, Dr. Guerrerosantos had been the force behind its creation and development. It is a state-owned institution, and therefore the state pays for operations conducted there.

During the existence of the hospital, Dr. Guerrerosantos has trained nearly 200 plastic surgeons. Each year, he accepts into the 3-year program 10 trainees who have completed their general surgery training. Therefore, there are 30 young surgeons in training: 20 of them operate at the institution, and 10 of them operate on a rotating basis at 5 other hospitals in Guadalajara. Approximately 20 plastic surgery procedures are done daily at the institute, and nearly all of these procedures are done by the trainees. Dr. Guerrerosantos generally does 1 very complex operation at the institute on Mondays, Wednesdays, and Fridays and assists the trainees at other times. On Tuesdays and Thursdays, he operates in his privately owned clinic and there does approximately 4 procedures each day. For his work at the institute, he is paid approximately \$600 a month. In contrast, patients pay cash for operations conducted in his private clinic, where he also has beds for the overnight stay of his patients.

Dr. Guerrerosantos, I believe, is the most respected plastic surgeon in Mexico. One of his trainees, Dr. Oscar Suarez, transported me around Guadalajara and told me a lot about the training program. Dr. Suarez is from Costa Rica. Six of the 10 third-year trainees in plastic surgery under Dr. Guerrerosantos are from outside of Mexico, mainly from Central and South America. Some of the patients having plastic surgery procedures in Mexico as well as in Costa Rica are citizens of the USA who travel south of the border because of the excellent reputation of plastic surgery there and the lower cost compared with that in the USA. After completing the present year, Dr. Suarez will return to the capital of Costa Rica and join a large group of plastic surgeons there. He told me that there are 27 active plastic surgeons in Costa Rica, a country of approximately 3.5 million people. The hospitality provided by Dr. Guerrerosantos and his lovely wife, Martha, and also by Dr. Oscar Suarez was enormously appreciated.

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