Facts and ideas from anywhere

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JOHN SNOW, THE BROAD STREET PUMP, THE GHOST MAP, AND CHOLERA

In 2006, Steven Johnson's book on London's most terrifying epidemic was published (1), and in 2007, Sandra Hempel's book on the same topic was published (2). London in 1854 contained 2.5 million people in its 30-mile circumference. The city stank because of the animal waste and open sewers. Cholera, which had been in

India for hundreds of years and was common in people in caravans, military operations, pilgrimages, and sailing ships, reached England for the first time in June 1831 and again in 1853 and 1854. The cause of cholera, *Vibrio cholerae*, was unknown until it was isolated by Robert Koch in Egypt in 1883.

John Snow (1813–1858), the subject of both books, a vegetarian and teetotaler, received his apothecary and surgeon's licenses at age 25 from the Hunterian School of Medicine and established a general practice in London. In 1846, he witnessed one of the first uses of ether in London—for dental extraction—and this started his highly successful career as a researcher and practitioner in anesthesiology. In 1853, he administered chloroform to Queen Victoria for the birth of her eighth child.

Snow's interest in cholera began when he saw patients as a physician apprentice during the epidemic of 1831–1832 in England. That epidemic killed 32,000, and another in 1848–1849 killed 52,000. A study of a series of cases and other observations led Snow to hypothesize that the disease was spread from person to person by the oral route, most likely through water, in contrast to the prevailing view that it was caused by the stench arising from open sewers, kitchen sinks, and rubbish piles. His 1849 publication, 31 pages long, describing his conclusions was ignored by the medical establishment.

Snow's "grand experiment" came in the summer of 1854, when cases of cholera began occurring mainly among people living along the Thames River. In 1849, both water suppliers—the Lambeth Water Company and the Southwark and Vauxhall Water Company—drew their water from the most polluted part of the river. But in 1852, Lambeth moved its supplies north, beyond the city's outpouring of sewage into the Thames. Snow

compared the frequency of cholera in 300,000 people whose circumstances were similar except that one group received water containing the sewage of London and the other received water free from the sewage. This involved Snow's "shoe-leather epidemiology" technique of going from house to house to determine which company supplied each household's water.

In the first 7 weeks, there were 1263 deaths from cholera in the 40,046 houses with water supplied by Southwark and Vauxhall, a rate of 315 per 10,000 houses. There were 98 deaths from cholera in the 26,107 houses with water supplied by Lambeth, or 37 per 10,000 houses. The signal event occurred in Snow's neighborhood near Golden Square in Soho, where cholera was out of control—197 residents had died within 3 days. Snow again marked the houses where the deaths had occurred and drew the "ghost map" showing their distribution. The result: 61 of the 83 people who died had obtained their water from the pump on Broad Street. His evidence convinced the skeptical members of the board of governors of St. James Parish to close down the pump by removing its handle on September 8, a week after the outbreak had begun. Although the outbreak had already peaked and was in decline, the removal of the handle almost certainly prevented a second outbreak. None of the 70 employees of the Lion Brewery, a few yards from the pump, got cholera. Having free access to malt liquor, they rarely, if ever, drank water!

Snow died of a stroke at age 45 before the impact of his work was fully appreciated. His brief obituary in the *Lancet* cited his research on anesthetics but did not mention his epic cholera studies. His story and the contributions that led to his legacy—the recognition of the importance of clean water—changed the world. Countless millions of lives have been spared as a consequence. His research ranks with that of Robert Koch, Louis Pasteur, Alexander Fleming, Albert Sabin, and Jonas Salk.

YELLOW FEVER IN MEMPHIS

Molly Caldwell Crosby has produced a magnificent book about yellow fever (3). The first half describes the yellow fever epidemic in Memphis in 1878, the year my father was born. In early 1878, Memphis had a population of 47,000; in the South, only New Orleans was larger. Memphis had survived the Civil War with very little damage, and Jefferson Davis chose the city as his home after the war. Businesses proliferated. Memphis was the largest inland cotton market. It was the crossway for

north and south via the Mississippi River and east and west via the railroads. But its sanitation was atrocious, and there was no clean water. Although poised for greatness at the beginning of 1878, Memphis would suffer losses greater than the Chicago fire, San Francisco earthquake, and Johnstown flood combined by the end of that year.

Yellow fever was the most dreaded disease in North America for 200 years. Although it did not kill as many people as cholera or smallpox and was not contagious, it created a panic and fear few other diseases, ancient or contemporary, can elicit. During its tenure in the USA, yellow fever afflicted 500,000 individuals and killed 100,000 of them. The devastating yellow fever epidemic in Philadelphia in 1793 prompted the move of the US capital from Philadelphia to Washington, DC.

During the first 100 years in what became the USA, yellow fever affected primarily the heavily populated northern port cities of Boston, New York, and Philadelphia. Then, in 1807, the Atlantic slave trade in the North was abolished, and the fever suddenly retreated from that region. As the North weaned itself from the slave trade, the South absorbed it and the accompanying fever. In the South, where slavery became deeply entrenched, yellow fever found its lifeblood. The virus had come from West Africa initially, probably via Cuba.

It was unheard of for a city as large as Memphis to have no waste disposal. Raw sewage and privies fed into the adjacent Mississippi River. Citizens in downtown Memphis carted and dumped their privies into the river, and over half of the city's privies were located ≤ 50 feet from drinking wells. A ship from West Africa, which had come through New Orleans, located 400 miles south of Memphis, docked in Memphis in July 1778. The population in that month was 47,000, but by August, 28,000 had fled the city. Of the 19,000 who remained, 17,000 developed yellow fever! It took a month after the first case of yellow fever in Memphis for the city's board of health to declare a yellow fever epidemic! That summer many citizens commented on how annoying the mosquitoes were.

Memphis, of course, was not the only place where yellow fever attacked in 1878. The entire Mississippi Valley, including 11 states, was affected, and a total of 20,000 lives were lost from the fever. Over 5150 lives were lost in Memphis alone. In Memphis, the mortality among the whites was 70%, and among the blacks, 7%: of 14,000 blacks, 946 died; of 6000 whites, >4000 perished.

In the fall of 1878, the Yellow Fever Commission of Experts, a joint committee represented by both the nation's Senate and the House of Representatives, was formed to investigate the epidemic. The board, however, failed to do anything more than provide statistics for past epidemics and the dismal results of the most recent one. It took the Spanish-American War in Cuba in 1898 and the building of the Panama Canal before the nation was forced to find the answer to yellow fever.

UNNECESSARY PRESIDENTIAL DEATH

The late Arthur M. Schlesinger Jr. (1917–2007) has edited a series of books entitled *The American Presidents*. One of the books is titled *James A. Garfield*, and it is written by a physi-

cian, Ira Rutkow, who is a clinical professor of surgery at the University of Medicine and Dentistry in New Jersey (4). James A. Garfield had served in the House of Representatives for nearly 20 years and was chairman of the minority Republicans there when he ran for the Senate from Ohio in 1878 and won. By the spring of 1880, despite talk concerning his character flaws, Garfield was recognized as one of the ablest and most effective legislators of his generation. He was deemed a leader of national stature. He had worked hard through the years and was a successful party strategist whom influential insiders regarded highly.

By February 1880, three candidates were touted as frontrunners for the Republican nomination for president: former President Ulysses S. Grant, James G. Blaine, and John Sherman (the younger brother of the renowned Civil War General William Tecumseh Sherman), who had served as US senator from Ohio before becoming a member of President Rutherford B. Hayes' cabinet. Sherman and Garfield has been friends for >20 years. In helping to place Garfield in the Senate, Sherman hoped to sidetrack any possibility of Garfield's emerging as a convention alternative nominee, following a three-way deadlock. Although Garfield supported Sherman, he doubted Sherman's ability to win the nomination but thought that Sherman's presence on the ballot would block Grant's nomination. As an added inducement for Garfield's support, Sherman promised that if he could not be nominated, he would transfer his entire convention strength to Garfield if he should emerge as a compromise candidate.

The first balloting for the presidential candidate yielded Grant 304 votes; Blaine, 284; and Sherman, 93 (379 were required for the nomination). Thirty-three ballots later, the vote totals were still fixed. On the 34th ballot, members of the Wisconsin delegation unexpectedly gave 16 votes to Garfield. On the 35th ballot, the Indiana delegates changed to Garfield. At that point, Sherman acquiesced, throwing his support to Garfield. With the 36th ballot, many Blaine and Sherman supporters switched to Garfield, and the dark horse candidate had the nomination (5).

Garfield took office on March 4, 1881, and on July 2, 1881, he was shot with a revolver in the Washington, DC, train terminal by Charles Guiteau, who stood 6 feet away. The bullet went into the right middle portion of his back and landed in the muscle in the left midportion of his back. Two ribs were broken and two vertebrae were fractured. The first doctor on the scene placed his unwashed finger and unclean instruments directly into the president's wound. About 15 minutes or so later, Dr. Willard Bliss (his given first name was Doctor), a boyhood friend of Garfield, arrived on the scene by horseback. He took the little finger of his unwashed and possibly manure-tainted left hand and passed it into the wound and thereafter followed it with probes going down at least 4 inches. (It is now well known that it is virtually impossible to determine a bullet's track by either finger or instrument.) Garfield was taken back to the White House, where during the next 79 days his wound was probed with unclean hands by a number of different physicians. He developed high fevers and became delirious. The doctor in

charge, Dr. Bliss, arranged for the wives of the various cabinet members to be his “nurses.”

Two months after Garfield’s death, Guiteau’s trial began. The assassin vehemently opposed the prosecution’s attempts to pin the murder on him. “Nothing can be more absurd, because General Garfield died from malpractice. The doctors ought to be indicted for murdering James A. Garfield, and not me,” he stated. Although Guiteau was insane, his courtroom utterances about medical malpractice were indeed accurate. The doctors caring for President Garfield did not follow any of the Listerian antiseptic principles.

Later, Dr. Arpad Gerster, a young New York surgeon who would write the country’s first surgical textbook based on Listerian principles, noted in his private memoirs that his generation of physicians considered the Garfield case a situation “where ignorance is Bliss.” Garfield’s doctors had continued to use traditional-style medicine when Lister’s methods were already well known and practiced by the younger physicians. Although nursing schools were started in the USA in 1873, Bliss never brought in trained nurses to care for the president. The person who did the autopsy on the president had little experience doing postmortem examinations. For the rest of his life, Bliss was an embittered and lonely man, and in 1889 he died of heart failure.

On March 30, 1981, 100 years after James Garfield was assassinated, President Ronald Reagan was shot by a mentally deranged young man. The bullet pierced Reagan’s left chest, punctured his lung, and stopped an inch away from his heart and aorta. Bleeding internally and short of breath, he was rushed to George Washington University Hospital, where he collapsed in the emergency room. Resuscitative measures stabilized Reagan’s condition, and within minutes he was in the operating room. By the time the 3-hour operation ended, the hemorrhage controlled, and the pulmonary injury repaired, more than 50% of the president’s blood volume had been replaced by transfusions. Reagan was on his feet within 24 hours of the shooting and 11 days later returned to the White House—fully able to conduct the nation’s business. Reagan’s wound was much more life-threatening than Garfield’s, and yet it did not kill or even significantly impair him despite his being 20 years older than Garfield. If Reagan had been shot in 1881, he would have died within hours of the shooting. Chest surgery did not exist in 1881.

How would Garfield have fared if he had received Reagan’s level of care? Dr. Rutkow related the following: Garfield likely would have arrived at a medical facility within minutes of the shooting with an intravenous line already in place; the emergency department physicians would have already scanned an electronically sent electrocardiogram and determined that there were no cardiac abnormalities. Physical examination of Garfield would reveal no obvious pulmonary or abdominal injuries. Since his vital organs were not injured, Garfield’s heart and respiratory rates, blood pressure, blood oxygen level, various blood tests, and urinalysis would be unremarkable. Under no circumstances would the bullet wound be probed or manipulated, but rather it would simply be covered with a sterile

dressing and left alone. Since President Garfield was shot in the middle of the right back, x-rays would be taken of the abdomen and chest demonstrating the presence of the bullet in the left side of his back and two splintered ribs and fractured thoracic and lumbar vertebrae. Everything else would appear normal. To further rule out injuries to structures located along the bullet’s path—including the colon, duodenum, kidneys, and pancreas—a high-resolution computed tomographic scan would be performed and would detail no damage other than what was already known, the bullet embedded deep in the president’s back muscles. By this time, 90 minutes would have passed since the assassination attempt and, fully conscious, Garfield would receive pain medicine. The hemorrhage having been moderate in amount, the president would not require transfusions. Garfield would remain in the hospital for observation for the next 24 hours, be started on antibiotics, and not be fed as a precautionary measure. The following morning, a hungry and relieved Garfield would return to the White House and begin rehabilitative therapy for his injured spine. In future histories of the Garfield presidency, the assassination would be regarded as a footnote rather than the whole story.

THE CHAMBERLEN FORCEPS

Wendy Moore (6) described in the *BMJ* how in the 16th century the Chamberlen family developed forceps almost identical to the ones used today. Unlike previous instruments—brutal hooks or crushers—that saved the mother but killed the infant, the Chamberlen instrument allowed operators to deliver a baby safely during an obstructed birth. Yet the Chamberlens kept this secret for 150 years, through four or five generations. Thus, while they saved countless lives, they “condemned many more to excruciating deaths by refusing to share their invention.” In addition, “the forceps provided the family—and male doctors in general—with the key to the previously all-female delivery room,” as Moore noted. These clever businessmen advertised their services and carefully concealed their invention from rivals.

CELEBRITY PATIENTS

Baron H. Lerner, a Columbia University physician and historian, has done a beautiful job tracing the degree to which celebrity patients have reflected and shaped the modern American understanding of physicians, patients, and illness (7). Lerner suggests that the way people experience the doctor-patient interaction and the patient-illness interaction is often determined by the big-name stories that become attached to particular medical disorders. Dr. Lerner believes that the story of John Foster Dulles, the secretary of state under President Dwight D. Eisenhower, and his battle with colon cancer in 1956 was the turning point in the attitudes of doctors and patients toward openness about serious illness. The honesty of Dulles’ physicians with him and his honesty with the American public marked a shift in social norms about serious illness, especially cancer. Lerner showed that throughout the 20th century, highly public cases like those of Dulles, Lou Gehrig, and Brian Piccolo became touchstones for how patients and their physicians would think and talk about major illnesses.

Lerner wrote of two types of “celebrity patients”: already famous people like Dulles, Gehrig, and Piccolo who then became ill and “ordinary” people who became famous because of their illnesses. In the latter category would be Libby Zion, the young woman whose death in 1984 led to limits on resident work hours; Barney Clark, the recipient of the first artificial heart; and Lorenzo Odone, a boy with adrenoleukodystrophy whose parents searched for a cure made famous in the 1992 film *Lorenzo’s Oil*.

MANDATORY HEALTH INSURANCE

Cynthia Crossen of *The Wall Street Journal* beautifully described the history of universal health insurance (8). Mandatory health insurance appears to have started in Germany in 1883 as a way of keeping workers in the country’s armies free of illness or injury. Most European countries followed not long thereafter. England passed the National Insurance Act in 1911, and in 1912 Theodore Roosevelt, campaigning for president on the Progressive Party ticket, endorsed compulsory health insurance as part of his platform. The same year the American Association for Labor Legislation started a crusade to make health insurance mandatory for workers who earned less than \$1200 a year (about \$25,000 today). The cost of the premiums would be shared by employer (40%), employee (40%), and the state (20%). Compulsory health insurance, proponents argued, would eliminate sickness as a cause of poverty.

For a few years it looked as though health insurance legislation in the USA was inevitable, with advantages for both workers and physicians. With access to prompt medical care, laborers would be able to return to their jobs more quickly, keeping their families fed, and physicians would prosper if more patients could pay their fees. More than a dozen state legislatures began considering compulsory health insurance based on a model bill drafted by the labor group. But the resistance group included commercial insurance companies, fraternal organizations, manufacturers, the American Federation of Labor, other labor unions, Christian Scientists, assorted xenophobes, communists, and physicians! Although united in their goal to defeat mandatory health insurance, the challengers had markedly different motives. Commercial insurance companies and fraternal organizations sold sickness and burial policies and feared losing business. Pharmacists suspected the government would start telling patients what medicines to take and how much they should cost. Labor union leaders argued that the solution to the problem of illness was not compulsory insurance but higher wages. Management did not want to pay for another benefit, especially if, as a representative of an industry trade group argued, “this sickness has been contracted either through intemperate or licentious living.” Christian Scientists, then a potent political force, argued that compulsory insurance meant “exclusively a material method of healing in preference to a spiritual method.”

America’s entry into World War I in 1917 provided another knock against health insurance: it was un-American. Health insurance bills in both California and New York were lobbied against by the insurance companies as “straight from Germany”

and “foreign to American ideals.” The bills never got out of committee in either state.

The American Association for Labor Legislation also failed to woo physicians, often ignoring their opinions when negotiating the legislation. Most physicians became convinced that health insurance would insert the dubious judgment of the government between patient and doctor and cut the latter’s pay. Charles H. Mayo, president of the American Medical Association, urged physicians to be wary of “anything which reduced the income of the physician” because that would “limit his training, equipment, and efficiency.” In the end, not a single state passed a health insurance law.

In June 1934, President Franklin Roosevelt issued an executive order establishing a Committee on Economic Security (9). The committee consisted mainly of various heads of Roosevelt’s cabinet. In October 1934, Ms. Frances Perkins, secretary of labor, formed a Medical Advisory Committee to the Committee on Economic Security “to study practicable measures for bringing about the better distribution of medical care in the lower income groups of the population and more satisfactory compensation of physicians and others who render medical services to individuals in these groups.” This Medical Advisory Committee had 11 members, all physicians, including Harvey Cushing, George W. Crile, and Stewart Ralph Roberts (my father) (9). The committee met in Washington, DC, at least twice and presented a unanimous report to Secretary Perkins in November 1934. The committee recognized that heavy risks and losses are occasioned by sickness; the expenses of sickness create a problem for many persons; and the uncertainty and insufficiency of payment create insecurity for many physicians.

The publication of the final report caused a storm of protests from the American Medical Association and from individual physicians. The committee finally recommended that any federal or state legislative action on health insurance in the USA be deferred until various experiments under different conditions and diverse localities could be suitably analyzed and made available. And now, nearly 75 years later, the same debate is still going on.

TOBACCO, CHINA, THE WORLD HEALTH ORGANIZATION, AND IRELAND

Wright and Katz in Boston have beautifully summarized the status of cigarette smoking in China and its reaction to the smoking-ban treaty of the World Health Organization (WHO) (10). During the past 20 years, smoking rates have fallen in high-income countries and increased in low-income countries. One third of current smokers live in China—more than in the USA and all European countries combined. WHO predicts that 70% of the deaths from smoking-related illnesses will occur in low- and middle-income countries by 2020. Smoking is likely to have a particularly devastating effect on China, where the annual death toll from smoking-related diseases already exceeds 1 million—2.5 times that in the USA—and is expected to double by 2025 if smoking rates are not reduced. China has no national health care system and little private health insurance, and many Chinese go bankrupt taking care of sick family members.

The Chinese government owns the largest cigarette monopoly in the world, China National Tobacco, which produces 1.8 trillion cigarettes annually. In 2005, cigarette sales generated \$32.5 billion in taxes and profits in China, 7.6% of the government's total revenue. In contrast, the Chinese government spent \$31,000 on tobacco control. Chinese consumers spend more on cigarettes than on alcohol or personal care products. Tobacco is seen in China as a key to economic growth in the more remote, poorer sections of the country. Health effects of smoking are commonly downplayed in China, even by those in key political positions. Half of all male Chinese physicians smoke! Even a few Chinese tobacco-control advocates expressed mixed feelings about promoting the use of graphic warning labels on cigarette packages, recognizing that ugly pictures would mar the packs traditionally given as presents to wedding guests.

Currently, only 3% of women and 10% of middle-school children smoke in China, but international manufacturers are already targeting these populations. Billions of foreign cigarettes are already smuggled into China each year, and recently candy-flavored cigarettes have become one of the most popular illegal imports. Public health experts described these as "starter cigarettes" aimed at children.

Despite the fact that the Chinese government depends on cigarette sales for a significant portion of its income, in 2005 China ratified the WHO Framework Convention on Tobacco Control. To date 145 countries, representing more than 80% of the world's population, have ratified this international public health treaty, which took effect in February 2005. The treaty aims to regulate tobacco companies' actions using proven strategies: raising taxes on tobacco products, limiting smoking in public, requiring new health warnings on cigarette packages, and regulating the firms' manufacturing and marketing efforts. China's surprising decision to ratify the treaty has won it influential friends in the global tobacco-control community. In contrast, the USA has yet to ratify this treaty! A two-thirds vote of the Senate is required for ratification, but the Bush Administration hasn't even sent the treaty to the Senate for vote!

In 2004, as Koh and associates (11) described, Ireland was the first country to implement a comprehensive smoking ban in indoor workplaces, including restaurants and bars. Ireland's policy has proved to be both popular and enforceable, with ready compliance, no decline in business, and improved health outcomes for hospitality workers. Overwhelming support for the ban has come from smokers and nonsmokers, dispelling the belief that restaurants and bars should represent bastions of smoking and socialization. For a country traditionally known for its smoke-filled pubs, Ireland is to be congratulated. Within months of the Ireland ban, New Zealand successfully implemented a comprehensive smoking ban. Other countries followed. Most smoke-free countries are in Europe, although a number of these countries allow for a designated, enclosed, ventilated smoking room. Australia and Canada are now poised to join the group. Although the USA lacks a federal policy, 17 states and many municipalities have smoke-free public places. The US government needs to follow Ireland's lead and the lead of Baylor Health Care System, which has banned smoking in all of its properties.

"FIRE-SAFE" CIGARETTES

Peter Eisler described fire-safe cigarettes, those designed to go out if dropped or set aside (12). Eleven states have mandated that all cigarettes sold within their borders meet fire-safe standards. Most fire safety groups support a federal standard. Why should a national standard be delayed if these fire-safe cigarettes actually prevent fires?

COSTS OF GENERIC DRUGS

Generics are not always less expensive than brand-name drugs (13). The price of generics varies by vendor. For example, 30 tablets of a 20-mg dose of Zocor cost \$150 at Walgreens.com compared with \$90 for simvastatin, the generic version. The same dose of simvastatin costs \$109 at CVS's website compared with \$155 for Zocor. However, at Sam's Club, 30 tablets of the 20-mg dose of simvastatin cost \$7. Generics of a number of other notable drugs that came off patent in recent months also have so far failed to deliver big savings.

How far and how fast generic prices fall depend on a number of factors: how many generic makers sell the drugs; how much competitive pressure pharmacies feel; whether there is another alternative, such as a different generic in the same class of drugs; and whether a particular generic maker gets an initial exclusivity. By law, the first generic maker to challenge a patent on a branded drug and prevail wins 6 months of exclusive sales. Online price searches can save money.

SLEEP

According to the National Sleep Foundation's 2005 Sleep in America Poll, US adults average 6.9 hours of sleep each night (14). Up to 70 million Americans cope with sleep disorders or chronic sleep loss, according to a guide about healthy sleep from the National Institutes of Health. In 2006, consumers spent \$3.6 billion on prescription sleep medications, up 29% from 2005, according to IMS Health. It reported that >48 million sleep aid prescriptions were written in 2006. Ambien and Lunesta are two of the biggest sellers, but Rozerem is coming up fast. Relaxing mood music, body care products, and room scents are also selling well.

INCREASING CANCER BURDEN

A recent piece in the *Journal of Oncology Practice* indicates that the number of Americans with a diagnosis of cancer—both those in treatment and those who have finished their therapy—will grow to just over 18 million by 2020, up from nearly 12 million in 2005 (15). Today, about 1 in 26 Americans have had cancer. By 2020, roughly 1 in 19 will have received a cancer diagnosis. The increase parallels the growth in the number of Americans >65 years of age. Patients also are living longer after a cancer diagnosis because of earlier detection and better treatments. There may not be enough physicians and nurses to care for so many cancer patients in the future (16). More than half of medical oncologists today are >50 years of age.

Some experts disagree with these findings, suggesting that declining smoking rates will reduce the number of lung cancer cases, presently the most common fatal cancer. Screenings and

new treatments might also reduce the need for intensive medical treatments such as chemotherapy. Colonoscopies have helped reduce the frequency of colorectal cancer. Finding neoplasms earlier, when they often can be treated by surgery alone, may also be helpful. Our increasing waistlines may put more Americans at risk. Possibly 20% of cancer deaths in women and about 15% of cancer deaths in men are related to obesity.

THE REAL DOCTOR IN THE HOUSE

It's mom. She knows her kids better than anyone (17). The Kaiser Family Foundation reported in 2003 that 80% of mothers assume the major role in choosing the family doctor and taking children to appointments. Wives often make their husbands' appointments and accompany them on the visit. Women, of course, tend to manage the household, child care, and mealtime, so it makes sense that they would also manage family health. And women are bigger users of health care than men and are far more likely to have a personal physician themselves. One theory is that the hormones of pregnancy and the powerful events of motherhood, such as childbirth and breastfeeding, may permanently alter the brain, equipping mothers with enhanced cognitive abilities that help them care for their young. Good pediatricians take mothers very seriously.

SPLITTING LIVERS

Lauren Neergaard reviewed this topic (18). The liver is unlike any other organ: a piece of a healthy one can grow into a whole organ in about a month. That's why some people receive liver transplants from living donors who have just a portion of their organ cut out and given away. Split-liver donation is different—it divides the organ donated when someone dies to try to save two lives rather than one. Unfortunately, it accounts for only 2% to 3% of the >6000 liver transplants annually. Just 123 split-liver transplants were performed in the USA in 2006, according to the United Network for Organ Sharing, which runs the transplant system. Usually when a liver is split, an organ too large for a baby or small child is cut to fit, and pediatric surgeons offer the other part to the next candidate on the waiting list. A liver also can be sliced into 60–40 sections for two adults, as is done with living donors. But split-liver transplants between two adults are controversial.

Not every transplant center has the expertise or the incentive to split livers, especially those centers that treat only adults, because it is a more technically challenging operation. It poses a slightly higher risk of postsurgical complications, such as difficulties maintaining the blood flow necessary for the organ to survive. Nor is every donated liver splittable. Typically, the donor is a young adult who died from an accident. The United Network for Organ Sharing estimates that >1000 livers donated a year might qualify for splitting. Pending proposals would mandate that all transplant centers be notified when a potentially splittable liver is donated and that the search for a matching recipient identify those willing to accept a partial organ. Surgeons calculate the minimum amount of healthy liver a patient needs in the month it will take to regenerate. The slightly increased risk associated with split-liver transplants is usually due

to inadequate size of the partial organ, problems with how the organ was divided, or delays in transplanting.

HAND TRANSPLANTATION

Dr. Adrian Flatt recently sent me an article on hand transplantation by Schuind and colleagues (19). Hand replantation is an emergency intervention, and the patient is immediately taken to the operating room. Hand transplantation, in contrast, can be better planned, but hand transplantation must be done within 6 hours after excision from the donor. The first attempt to transplant a human hand was undertaken in Ecuador in 1964, but at that time immunosuppressants were not available and the hand was rejected after 2 weeks. The first human hand transplantation utilizing several immunosuppressant drugs was performed in Lyon in 1998, and the second was performed a few months later in Louisville. The second graft is currently the longest-surviving hand transplant in the world. The first two cases were unilateral transplants. The first bilateral hand transplant was carried out in France, followed by cases in Austria and China. As of December 2005, 23 hand transplantations in 17 adults had been reported to the International Registry; patient survival was 100% and graft survival, 91% after a mean of 45 months. Two hands have had to be reamputated, one as a consequence of progressive rejection in a noncompliant patient (the Lyon case) and the second in China for arterial thrombosis after steroid injections.

Hand transplantation is still considered an experimental procedure. The cost of immunosuppression is very high (up to \$25,000 yearly), and insurance companies do not routinely cover these expenses. However, hand transplantation is feasible, both surgically and immunologically, in highly selected patients.

ATTRITION RATES IN US MEDICAL SCHOOLS

The Association of American Medical Colleges analyzed students leaving US medical schools due to academic reasons in years 1987, 1992, and 1995 (20). After 10 years, the 3 cohorts averaged 1.4% academic attrition. Most departing students left before the fourth year. A pretty good record, I say.

BIOBANKS (GENOME DATABASES, HUMAN GENETIC RESEARCH DATABASES)

Biobanks collect biological samples principally as a source of DNA and record detailed personal information about the donors: what they do, how they live, and the illnesses they have (21). There are probably 100 such databanks with ≥10,000 donors presently. Some are private, some public; some are large, some small; some try to reflect entire populations, others concentrate on smaller subgroups. The underlying intention in most is to reveal how genetic and nongenetic factors interact in determining health and disease. The United Kingdom has just initiated a databank that intends to gather information on the health and lifestyles of 500,000 volunteers aged 40 to 69 years. Participants donate blood and urine samples, have basic health checks, and fill in a questionnaire. Canada, Estonia, and Iceland intend to acquire donor samples on 50,000 to 100,000

individuals. The information garnered from these biobanks may well revolutionize medicine.

WORK ILLNESS, WORK INJURY, AND BODY WEIGHT

Østbye and colleagues (22) from Duke University Medical Center examined the relation between body mass index (BMI) (calculated as weight in kilograms divided by height in meters squared) and number and types of workers' compensation claims, associated costs, and lost work days. They found a clear relation between BMI and rate of claims. The claims most strongly affected by BMI were related to the lower extremity, wrist or hand, and back; local pain, sprain or strain, and contusion or bruise; and falls or slips, lifting, and exertion. Thus, maintaining healthy weight is important not only to the person but also to the person's employer.

PRINT ON PILL BOTTLES

As Bob Moos writes, consumer advocates are lobbying pharmacies for more legible labels, and state lawmakers are writing legislation to require larger type (23). People ≥ 50 years account for most pharmacy sales, and that segment of the population is expected to double over the next 25 years. A survey done for CVS Pharmacy found that 56% of Americans ≥ 50 years take ≥ 3 prescriptions daily, and 21% take 5 to 9. Some patients apparently skip taking their medicines because they cannot read the instructions on the bottle.

BANNING JUNK FOOD AT SCHOOLS

The Institute of Medicine, which advises Congress on health and science, issued new guidelines that recommend that schools stop offering soft drinks, candy, cookies, snack cakes, regular potato chips, and other high-fat, high-caloric foods and beverages in vending machines, a la carte lines, stores, and at fund-raising events and holiday parties (24). Instead, schools, which would have to voluntarily adopt the recommendations, should be offering foods such as apples, raisins, carrot sticks, fruit cups, some granola bars, bottled water, yogurt, and nonfat or low-fat milk. The report, prepared by food and nutrition experts, addresses discretionary purchases of foods but does not cover bagged lunches that children bring to school or what is served in the federal school lunch and breakfast programs. There are 50 million children and teenagers in our schools, and only about 20% of school districts have nutrition standards for foods sold outside of school-prepared meals. About one third of those children and teens are overweight or obese. On school days, children get 30% to 50% of their calories at school.

FOR GOOD NUTRITION

See the new website (www.NutritionMD.org) of the Physicians Committee for Responsible Medicine (25).

ATKINS DIET FORTUNE

According to Robert Frank of *The Wall Street Journal*, Dr. Robert Atkins left an estate of \$400 million when he died after a fall on April 17, 2003 (26). Ms. Veronica Atkins, his widow, who has since remarried, was left the bulk of it. Ms. Atkins was

unprepared for the windfall she received after his death when his diet products business was sold for some \$600 million. After taxes and payouts to other shareholders, she was left with about \$400 million. That's a lot of money for products that may not be healthy. Americans spend too much money on diet fads!

ANIMAL SPEED

The cheetah is the fastest animal, running at speeds up to 69 miles per hour; the antelope is next at 50; then the horse at 34; elephant at 31; human at 25; and Chihuahua, the world's smallest dog, at 7 miles per hour (27).

TOTAL NUMBER OF ORGANISMS

A worldwide scientific effort to catalog every living species has topped the one million milestone (28). Six years into the program, the total has reached 1,009,000. The hope is to complete the listing by 2011, reaching an expected total of about 1.75 million species. The finished catalog will include all known living organisms from plants and animals to fungi and microorganisms (bacteria, protozoa, and viruses). Presently, there is no comprehensive catalog of all known species of organisms on earth. The project involves 3000 biologists led by Frank Bisby of the University of Reading, England, and Thomas M. Orrell of the Smithsonian National Museum of Natural History.

US POPULATION AND ITS INFRASTRUCTURE GROWTH

According to Haya el Nasser, the USA is growing more rapidly than any other developed nation and is projected to gain another 100 million people by 2040 (29). That will put new pressure on its infrastructure. The nation will need another 280,000 miles of highway, and 78 million more cars and trucks will jam roads by 2040, according to the Federal Highway Administration and Center for Environment and Population. Based on current energy use, the country will need to build >500 medium-sized power plants to generate the extra electricity the USA will use by 2030. If the USA's per capita water use for home, industry, and agriculture remains at 105 gallons a day, it will need another 150 billion gallons, about 3 times what California now consumes, every single day.

The answer will have to come from technology. Some less visible innovations are already under way. Power substations are being placed underwater and underground, and parks are being built above them to maximize green space. Water pollution projects are turning sewage into water that is fit for drinking. The recycled water can be used by industries and by water parks and golf courses without depleting rivers and lakes. To lure people out of their cars and on to buses, transportation agencies are using wireless technology so riders can stay linked to the Internet during their commutes.

THE BIGGEST METRO AREAS AND CHANGING DEMOGRAPHICS

A major piece in *USA Today* described the July 2006 population of numerous US cities as determined by the Census Bureau (30). Populations of some of our largest cities (rounded off) with percentage increase since 2000: New York, 18,800,000 (2.7%); Los Angeles, 13,000,000 (4.7%); Chicago, 9,500,000

(4.5%); Dallas–Fort Worth, 6,000,000 (16.3%); Philadelphia, 5,800,000 (2.5%); Houston, 5,500,000 (17.5%); Miami, 5,500,000 (9.1%); Washington, DC, 5,300,000 (10.3%); Atlanta, 5,100,000 (21%); and Detroit, 4,500,000 (0.4%). The five fastest-growing cities in the last 6 years are Phoenix (24%), Riverside (24%), Atlanta (21%), Houston (17.5%), Dallas–Fort Worth (16.3%), and Tampa–St. Petersburg (12.6%).

Michael Barone examined recent changes in population movement in the USA from the 2000 census to census estimates for 2006 (31). He looked at the census estimates for 50 metropolitan areas with >1 million people in 2006. In the coastal megalopolises (New York City, Los Angeles, San Francisco, San Diego, Chicago [on the coast of Lake Michigan], Miami, Washington, DC, and Boston), Americans are moving out and immigrants are moving in. Los Angeles, including both Los Angeles County and Orange County, had a domestic outflow of 6% of the 2000 population, but it was balanced by an immigrant inflow of 6%. The numbers are the same for these eight metro areas as a whole. Americans, in other words, are now moving out of, not into, coastal California and south Florida, and in very large numbers are moving out of our largest metro areas, including Boston, San Francisco, and Washington, DC. The domestic outflow from these metro areas is 3.9 million people, 650,000 a year. High housing costs, high taxes, and a dissatisfaction in some cases with the burgeoning immigrant populations are driving the previous city dwellers elsewhere. The result, according to Barone, is that these coastal megalopolises are increasingly a two-tiered society, with large affluent populations and a large, mostly immigrant low-wage-earning working class. The economic divide in New York City and Los Angeles is starting to look like the economic divide in Mexico City and São Paulo. The coastal megalopolises grew 4% in 2000 to 2006 while the nation grew 6%. As a consequence, New York, New Jersey, Massachusetts, and Illinois are projected to lose 5 House seats in the 2010 census, and California is projected to pick up none.

An entirely different picture is occurring in the 16 metro areas that Barone calls “interior boomtowns.” Their population has grown 18% in these 6 years. They had considerable immigrant inflow, namely 4%, but with the exceptions of Dallas and Houston, this immigrant inflow has been dwarfed by a much larger domestic inflow, namely 1.5 to 3 million overall. Domestic inflow has been 19% in Las Vegas, 15% in California’s Riverside and San Bernardino counties (where much of the outflow from Los Angeles has gone), 13% in Orlando and Charlotte, 12% in Phoenix, 10% in Tampa, and 9% in Jacksonville. Domestic inflow is over 200,000 in Phoenix, Atlanta, Las Vegas, and Orlando. These cities are economic dynamos that now drive much of the country’s growth. There is much less economic polarization than in the coastal megalopolises. The natural increase (the excess of births over deaths) in the interior boomtowns is 6%, well above the 4% in the coastal megalopolises.

The nation’s center of gravity is shifting: Dallas is now larger than San Francisco, Houston is now larger than Detroit, Atlanta is now larger than Boston, and Charlotte is now larger

than Milwaukee. State capitals that were just medium-sized cities dominated by government employees in the 1950s—Sacramento, Austin, Raleigh, Nashville, and Richmond—are now booming centers of high-tech and other growing private-sector business. San Antonio has more domestic than immigrant inflow even though the border is only a 3-hour drive away. The interior boomtowns generated 38% of the nation’s population growth in 2000 to 2006.

The old Rust Belt, which suffered greatly in the 1980s—Detroit, Pittsburgh, Cleveland, Milwaukee, Buffalo, Rochester—has lost population since 2000. Their domestic outflow of 4% has been only partially offset by an immigrant inflow of 1%. Another category is what Barone calls the “static cities.” These are 18 metropolitan areas with immigrant inflow between 0% and 4% with domestic inflow up to 3% and domestic outflow no higher than 1%. These include Seattle, Denver, Portland, Minneapolis, St. Louis, Cincinnati, Kansas City, Columbus, Indianapolis, Norfolk, Memphis, Louisville, Oklahoma City, and Birmingham. Overall, the static cities had a domestic inflow of just 18,000 people (.048%) and an immigrant inflow of 2%. Two cities have not been included anywhere, namely New Orleans, which lost 25% of its population after Katrina, and Salt Lake City, which grew 10% from 2000 to 2006. The chief driver of population growth in Salt Lake City is kids. Its natural increase was 9%, the largest of any metropolitan area, much greater than San Francisco’s 3% or Pittsburgh’s 1%. These demographics, of course, will lead to political changes.

COMMUTING

Will Sullivan recently had a nice piece on commuting in the *U.S. News & World Report* (32). People have been complaining about traffic congestion since the time of Julius Caesar, who banned some traffic in downtown Rome. Since the interstate highway system was begun in the 1950s, traffic in the USA has grown dramatically. Americans spent 3.7 billion hours in traffic in 2003, the last year for which such figures were available. That was a fivefold increase from just 21 years earlier. The amount of free-flowing traffic today is less than half what it was in the 1980s.

The issue, of course, boils down to population growth outpacing road building. There are 70 million more people living in the USA than 25 years ago, but highway miles have increased just over 5% in that time. The Department of Transportation estimates that the demand for ground transportation—either by road or rail—will be 2½ times as great by 2050, while the highway capacity is only projected to increase by 10% during that time. The average household size now in the USA is only slightly greater than the number of cars (1.9 vs 1.8). High property values and restrictive zoning in many areas have made finding quality housing near one’s workplace virtually impossible for many, and the quest for affordable housing has sent people to ever more distant locales.

According to the US Census Bureau, 3.5 million Americans—about 2.8% of workers—now have commutes of ≥90 minutes to work, a 95% increase from 1990. The 10 worst commuter cities are all, except Chicago, located on the coast. The

mean travel time to work, in minutes, in New York is 39; Boston, 30; Newark, 32; Philadelphia, 32; Washington, 29; San Francisco, 29; Los Angeles, 30; Riverside, 29; Long Beach, 29; and Chicago, 34. These times will only lengthen in the future.

What can be done? Houston is aggressively building more roads. But significantly increasing road capacity is not feasible for metropolitan areas with high population densities, such as Chicago or Philadelphia. The Boston “Big Dig” project was too expensive and maybe not particularly successful. Public transportation may be the answer. Los Angeles is digging new subway tunnels and expanding a rapid bus system that would let buses zoom down their own designated lanes. Charging tolls based on the level of congestion will soon be initiated in some cities. Fees for entering urban areas are being considered in several cities, including New York.

Long commutes can increase loneliness and cut back social activities, undermining happiness (33). Nine out of 10 commuters travel by car, and 88% of those drivers do so alone. Those long periods in the car not only provoke loneliness but also reduce time for sleep, sports, and socializing. Every 10 minutes of commuting results in 10% fewer social connections. And there are some economic consequences as well. An hour-long commute requires a 40% boost in salary to keep the commuters as “satisfied” with their lives as noncommuters.

A British scientist who studies the brain’s response to stress found that the tension commuters experience when stuck in traffic is comparable to that felt by a first-time parachutist. A 2004 article in *The New England Journal of Medicine* found that being stuck in a traffic jam more than doubles one’s chance of experiencing a heart attack in the subsequent hour, and sleep deprivation and digestive problems are also linked to long commutes.

OIL

We are using 86 million barrels of oil per day (each barrel contains 44 gallons). According to Demitra DeFotis, if every oil well in the world were running, 88 million barrels would be produced each day (34). Thus, the world’s margin of oil is very small. That’s why the price keeps rising.

TRAVEL FATIGUE VS JET LAG

Travel fatigue is just that, namely travel weariness or general fatigue (35). It is due to disruption of sleep and normal routine, difficulties associated with travel (checking in, baggage claim, customs clearance), and dehydration. Jet lag is different. Its symptoms are poor sleep during the new nighttime, including delayed sleep onset (after eastward flights), early awakening (after westward flights), fractionated sleep (after flights in either direction), poor performance during the new daytime at both physical and mental tasks, irritability, and decreased ability to concentrate. Also, some gastrointestinal symptoms may occur. The cause of jet lag is slow adjustment of the body’s clock to the new time zone so that daily rhythms of sleep and wakefulness are out of synchrony with the new environment.

Travel fatigue is associated with any long journey; for jet lag to occur, generally ≥ 3 time zones need to be crossed rapidly.

But, there are differences in individual susceptibility to the effects of changing time. Some people even have difficulty dealing with a 1-hour time zone change. Travel fatigue abates by the next day following a good night’s sleep; jet lag lasts for several days, roughly equal to two thirds of the number of time zones crossed after eastward flights and about half the number of time zones crossed after westward flights. Again, there are differences between individuals.

Waterhouse and colleagues (35), from whose review this information was garnered, provided advice for coping with travel fatigue and jet lag. Drink plenty of water or fruit juice during the journey rather than tea, coffee, or alcohol. On reaching the destination, relax, rehydrate with nonalcoholic drinks, shower, and nap briefly. I must admit that I have tried about every recommended bit of advice in coping with jet lag but have not found any predictable remedy. Melatonin has had mixed success.

FIRE AND RAIN

A wildfire in Minnesota near the Canadian border covered >34 square miles. A wildfire in California near Los Angeles covered >800 acres. A tornado wiped out Greensburg, Kansas, a town of 1400 people. In Florida, 220 separate fires covered 80,000 acres, or 125 square miles. In southeast Georgia, the state’s largest-ever wildfire raged for >3 weeks near the edge of the Okefenokee Swamp. It has burned nearly 110,000 acres, or 167 square miles, of forest and swampland. Another fire caused by lightning in the Okefenokee area has covered $>40,000$ acres. High water in Missouri has poured over the tops of 20 levees along the Missouri River and other streams, resulting in one of the top three floods ever in that state. Subtropical storm Andrea churned about 100 miles southeast of Savannah, Georgia. The drought in the western part of the country is the worst in many years. All of this occurred in the first 10 days of May 2007. The planet is changing!

PERPETUAL DROUGHT

Texas almost certainly faces a future of perpetual drought as bad as the record dry years of the 1950s because of global warming (36, 37). The trend toward a drier, hotter, southwestern USA, including all of Texas, probably has already begun and could become strikingly noticeable within about 15 years, according to a study done by Columbia University’s Earth Observatory. The drought projections came one day before the Intergovernmental Panel on Climate Change released its latest report on the effects of a changing climate. The study published in *Science* (38) examines the expected changes in precipitation in North America in 2001–2004 compared with 1950–2000. In general, wet areas will become wetter and dry areas will become drier. All of Texas will receive significantly less rain. Parts of New Mexico, Arizona, Western Mexico, the Yucatan Peninsula, and nearly all of Central America will see extreme drought. The perpetual drought conditions, foreseen by the Columbia study, result from planetary-scale changes driven by higher temperatures around the globe.

FEDERAL INCOME TAXES

Forty percent of households in the USA—>44 million adults—pay no income taxes (39, 40). Twenty percent—the middle class—pay very little. The top 40% (those who earn >\$43,200), the upper middle class and the wealthy, pay 99% of the federal income taxes in the USA. The top 1% of income receivers in the USA pay 37% of all the income tax. One percent takes in <17% of the country's income but pays almost 37% of the country's income tax! The richest 10% (those earning >\$87,300 annually) pay 71% of the income tax bill. As Ari Fleischer states, "If, as it happens now, 60% of the people in our democracy can force 40% to pay the bills, what's to stop 65% from making 35% pay it all? Since no one wants to pay taxes, what's to stop 90% of people in a democracy from making 10% pay it all?"

When it's time to retire, lower-income workers typically receive more in Social Security benefits than they paid in, while the wealthy, who paid the most in taxes, simply can't live long enough to get back what they paid. For much of the middle class and the wealthy, Social Security isn't a retirement program; it's another program that redistributes their income.

As for Medicare, it doesn't matter that the rich pay far more in taxes; all recipients receive the same benefits. As Fleischer puts it, "If Medicare were a car, its price for a low-income worker would be \$145 and its price for a millionaire would be \$14,500, even though it's the very same car." A taxpayer who makes \$1 million a year pays \$14,500 in Medicare taxes, while a worker who makes \$10,000 a year pays \$145. When they retire, however, and visit their physicians or go to the hospital, Medicare reimburses both an equal amount of money. That's a big redistribution and a pretty good deal for the lower-income worker.

A system in which almost half the country pays no income taxes and 40% pay all the income tax has gone too far. Instead of raising taxes and punishing the successful by making them pay even more, it's time to junk the current system and start anew with a code that fosters economic growth for all, not increased redistribution of income for some.

According to Thomas G. Donlan, the total tax take of federal, state, and local governments in 2006 will be just under \$4 trillion, two thirds of it federal (41). The total national income in 2006 was \$12.1 trillion. In other words, taxes in 2006 took 33% of national income.

FEDERAL GOVERNMENT DEBT

This is something no politician wants to talk about and for good reason. The baby boomers will begin to retire in the near future and instead of contributing to Social Security, the boomers will draw from it. They will join the Medicare rolls as well. The costs of these programs will swell, and younger Americans will be unable to pay for them. In 2010, the annual Social Security surplus, used to mask the size of the already massive federal budget deficit, will begin to shrink, forcing the next president and future Congresses to raise taxes or borrow more (42). This will crimp living standards, either by taking money away from people or by boosting interest rates, making everything more expensive. In 2016, the surplus, currently \$68 billion, will turn

into a deficit. The state of Medicare is even more troubling. Last year it used \$408 billion. (In 1970, Medicare cost only \$7.5 billion.) By 2016, it will have more than doubled to \$863 billion. That's almost like creating another Pentagon budget.

Later in the century the projections for health and retirement spending reach such levels that if left unaddressed they could bring down the US economy. If Medicare and Social Security are funded through new taxes, the government would swell from approximately 20% of the American economy to nearly 60% by mid-century. Retiring the current \$9 trillion national debt and paying up front for the projected Medicare and Social Security shortfalls would cost \$46 trillion, almost equaling the estimated net worth of all Americans. In other words, government could solve the problem now by seizing all the assets of all its citizens!

CHINESE RESERVES

The government of China, a country where >100 million people subsist on <\$1 a day, is sitting on \$1.07 trillion of foreign currencies and securities, making it one of the biggest investors in the world (43). Japan has \$900 billion in foreign exchange reserves; Russia, \$304 billion; Taiwan, \$266 billion; Korea, \$240 billion; India, \$179 billion; Singapore, \$137 billion; Hong Kong, \$134 billion; Germany, \$112 billion; and France, \$98 billion. China's reserves increase by \$20 billion each month, and the reserves in the USA decrease about \$20 billion each month. The USA is rapidly losing its edge.

HIGH SCHOOLS AND COLLEGES

There are 3.5 million high school seniors across the USA, and approximately 2.4 million of them will enter a college or university in the fall (44). There are 2533 4-year colleges or universities in the USA to choose from. Al Neuharth suggests that it is probably better for high school seniors not to worry about which college or university will accept them but rather what they will learn and do while there and after graduation.

COLLEGE WITHOUT FEES

Top colleges are offering a growing number of courses free online (45). It started with the Massachusetts Institute of Technology. Other highly competitive schools are now posting online lecture notes, sample tests, and audio and video of actual lectures. These are not distance learning courses that many schools offer for credit and charge for, but many colleges and universities say they want to "democratize education," making the best resources available to more people. They also hope that doing so will lead to more interest from potential applicants and inspire alumni to make donations. Massachusetts Institute of Technology's pioneering OpenCourseWare program, which was launched in 2003, posts the syllabi and class notes for >1500 courses online for anyone who wants them. By November 2007, it aims to publish materials from virtually 1800 of its courses across all its schools. In September 2006, the University of Notre Dame began offering material for eight courses; in 2 more years, it will offer material for 30 courses. Yale, Tufts, Stanford, and the University of California at Berkeley will soon also begin of-

fering college course material online without fees. Maybe some medical schools will follow suit in due time.

MASS MURDERS AT VIRGINIA TECH AND GUN CONTROL LAWS

It is hard to believe that Seung Huy Cho fired 170 bullets and did not know a single one of his 32 victims (46). In December 2006, 4 months before the murders, a local court found that Mr. Cho represented a possible danger to himself or others because of depression and suicidal tendencies. Two months after that, in February 2007, he obtained his two weapons without any apparent difficulty.

At the federal level, only a few modest gun restrictions have been passed since President John Kennedy was assassinated in 1963 (47). At the state level, the reverse has occurred. Many states have passed laws allowing citizens who could demonstrate that they were law abiding and had sufficient training to obtain permits on demand to own and carry concealed weapons. Today, if one meets the qualifications, 40 states permit carrying concealed weapons, and 67% of the nation's population lives in those states. Vermont has no gun restrictions at all. Only a very few concealed-weapons permits have been revoked in the last several decades. Rarely have people with concealed-weapons permits used them unlawfully. Ordinary law-abiding people appear to be pretty trustworthy.

Virginia has a concealed-weapons law, but Virginia Tech was, by the decree of its administrators, a "gun-free zone." Those with concealed-weapons permits were not allowed to take their guns on campus and were disciplined when they did. A bill was introduced into Virginia's House of Delegates to allow permit holders to carry guns on campus. When it was sidetracked, a Virginia Tech administrator hailed the action and said that students, professors, and visitors would now "feel safe" on campus. Obviously, Virginia Tech's zone was not "gun-free." Recently, the DC Circuit Court of Appeals ruled that the District of Columbia's ban on handguns violates the Second Amendment right to "keep and bear arms." This case may go to the Supreme Court. The mental health ruling on the Virginia Tech killer surely should have been entered into the instant-check database to prevent him from buying guns. Whether one is safer in places where gun ownership is widespread or safer in a gun-free zone continues to be debated.

When the Second Amendment was passed by our founding fathers "to keep and bear arms," the population in the USA was 4 million. Today, the population is 300 million, or 75 times larger than it was 200 years ago. Furthermore, the population of 4 million was relatively spread out. Today, most Americans live in cities where space between people is far less. It is hard to be antigun and be a Texan, but, nevertheless, I am. With well over 200 million handguns circulating in the USA, however, I have no idea how we could rid ourselves of them.

NEWSPAPER READING

According to a piece by Peter Johnson, US newspaper circulation fell 2.1% in the 6 months through March 2007 (48). Circulation at the 445 daily newspapers surveyed was 45 million, down from 45.9 million in the same period a year earlier. Aver-

age Sunday circulation fell 3.1%. Six of the 10 largest dailies and 555 of the newspapers in the survey reported that both weekday and Sunday sales declined. Average weekday paid circulation at the *Los Angeles Times* fell 4.2% in the 6-month period while that of the *Chicago Tribune* declined 2.1%. Circulation at *The Dallas Morning News* fell 14% after the newspaper discontinued service in some counties and discontinued promotional circulation programs. Average weekday circulation at *The Washington Post* slid 3.5%; at the *Boston Globe*, 3.7%; and at *The New York Times*, 1.9%. Circulation at *USA Today*, the country's largest newspaper, rose 0.23% to 2.27 million. Circulation at *The Wall Street Journal*, the second-largest newspaper, rose 0.61% to 2.06 million. Newspapers are trying to turn advertisers' attention to their websites to help stem the decline in ad revenue. The Internet is clearly taking over (49). Young people look at the screen rather than at the paper. It is hard to read to grandchildren, however, from the screen.

With fewer subscribers, there are fewer reporters in the newsroom. After two decades of growth, newspaper editorial staffs have been shrinking since 2000. As of 2006, there are about 53,000 reporters working for newspapers in the USA, according to the American Society of Newspaper Editors. One of my grandsons is interested in being a journalist, and these numbers are useful to keep in mind.

RETIREMENT AGE 60 FOR COMMERCIAL PILOTS

I started a new career at age 60! Commercial pilots have to retire at that age. According to DeWayne Wickham of *USA Today*, every day the Age 60 Rule remains in effect, the USA loses >5 experienced pilots (50). The age 60 retirement rule went into effect 48 years ago, and people live much longer today. Many bills have been introduced into both the House and the Senate to require the Federal Aviation Administration to implement the rule change within 30 days of its passage. So far, the bills have been left to languish in Senate and House committees, the kind of slow death that is the fate of legislation opposed by strong interest groups. In the case of the Age 60 Rule, the political resistance is being applied by the Airline Pilots Association, an organization that represents >64,000 commercial pilots. Most of its members oppose the rule change, which would make it harder for younger pilots to get the positions and favorable routes now held by more senior pilots.

Every day that this rule change is delayed, i.e., to increase retirement for commercial pilots to age 65, means that the nation's most qualified commercial pilots lose their jobs and air travelers lose the benefit of their experience. Ironically, some pilots extend their careers and continue to fly in and out of the USA by going to work for foreign airlines. The International Civil Aviation Organization, representing 190 countries, raised its retirement age for pilots to 65 in November 2006. Congress should find the courage to quickly impose the new pilot retirement age.

FIRST OFFICIAL FEMALE MARATHONER

According to Katherine Hobson of the *U.S. News & World Report*, in the April 16, 2007, Boston Marathon there were 23,000 runners, and 40% were women (51). In contrast, in

1967, there was just one official female entrant, Catherine Switzer, barely out of her teens. Switzer's new book, *Marathon Woman*, chronicles her journey to the Boston start in 1967 and what she has done since crossing the finish line. She says if you can run a marathon, you know you can do anything. She calls exercise the fountain of youth. She says she looks better at 60 than her mom did at 40. Exercise really keeps you healthy, keeps your weight down, and keeps you feeling good about yourself. It's going to help us live not necessarily longer but better. Switzer secured the women's marathon as an Olympic event and created the Avon Running Program. She says running is much more than fitness; it's about changing a woman's life.

DEATH PENALTY

Cynthia Crossen of *The Wall Street Journal* fame nicely reviewed the history of the death penalty in the USA (52). In the 1930s, an average of 167 people were executed each year in the USA; by the 1940s, that had dropped to 128, and by the 1950s, to 72 executions a year. The peak year of the death penalty was 1935: 199 people were hung, gassed, electrocuted, or faced firing squads. Between 1968 and 1976, not a single American was put to death for committing a crime. In 2006, 53 people were executed in the USA, all but one by lethal injection.

America's first immigrants brought (from England) a strong faith in the virtue of the death penalty. In 18th-century England, a person could be sentenced to die for 150 crimes, including forgery and horse theft. The list was much reduced in colonial America, but in theory one could still be put to death for witchcraft, blasphemy, or homosexuality. It did not make economic sense, however, to kill able-bodied men and women when labor was so scarce.

In the mid-19th century, several states abolished the death penalty for all but a few crimes, usually murder and treason. Michigan got rid of the death penalty, except for treason, in 1846. No reliable death penalty data exist until about 1930 when the Census Bureau began including execution as a cause of death. Historians estimate that in the 1890s a total of 155 people were executed; by the 1910s, that number had quadrupled as crime increased and law enforcement got better at catching criminals.

After World War I and through the 1920s, criminals became better armed, more mobile, and more brazen. Gradually, both federal and state governments began reinstating the death penalty or increasing the number of crimes that qualified for it. As a result, in the late 1930s an average of 178 people a year were legally put to death. (Throughout US history, especially in the 19th and early 20th centuries, there were thousands of extralegal executions, especially of African Americans.) Some believe more people were executed in the USA in the 1930s than in the 17th and 18th centuries combined.

In 1972, the Supreme Court declared all existing death penalty statutes unconstitutional. Many states began writing new laws to address the court's concerns. Executions resumed in 1977, and by 1999, a total of 98 people were put to death. Those executed that year had spent an average of almost 12 years on death row. In contrast, in 1935 when James Trout of

Louisville was sentenced to the electric chair for stealing \$433 from a local miller, his trial lasted 1 day and the jury deliberated for 143 minutes! It seems to me that the death penalty is a bit of a deterrent to crime.

BLAIR/BUSH VS HUNTINGTON

David Brooks, one of my favorite columnists, opines that Tony Blair's decision to support the invasion of Iraq grew out of the essence of who he is (53). Over the past decade, the British prime minister has emerged as the world's leading anti-Huntingtonian. One side, represented by Samuel Huntington of Harvard, believes humanity is riven by deep cultural divides and we should be careful about interfering in one another's business. On the other side are those like Blair and Bush, who believe the process of globalization compels us to be interdependent and that the world will flourish only if the international community enforces shared universal values. I am on the Huntingtonian side of this debate and believe that it is improper, futile, and energy- and resource-wasting to try to push our values onto others.

—WILLIAM CLIFFORD ROBERTS, MD
24 May 2007

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