Facts and ideas from anywhere

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DOCTORS OF ANOTHER CALLING

Dr. David K. C. Cooper has edited a splendid book describing in detail 35 physicians who became famous not in medicine but in a nonmedical arena (1). Each chapter describes one of these distinguished men (no women were among the 35), and an appendix entitled “Who Could Have Been Chosen” provides a lengthy list of physi-

cian writers, entertainers, explorers, athletes, politicians, military men, humanitarians, and educators, as well as a philanthropist, a few criminals, and prominent scientists in areas other than medicine.

The book begins with *St. Luke*, the most widely read physician, called by St. Paul “the beloved physician.” It then describes other famous physicians. *Dante Alighieri* (1265–1321), a physician in Florence, Italy, was exiled by political rivals in 1302 and never allowed to return. He devoted the remaining 19 years of his life to writing his famous trilogy, *The Divine Comedy*. *Nicholas Copernicus* (1473–1543), the Polish celestial physician, demonstrated that the Earth, rather than being the center of the universe, orbited around the sun. Thus, this physician is tied to the origins of astronomy and astrophysics. *John Locke* (1632–1704) was one of the greatest minds of the 17th century, a philosopher and political theorist but also a pragmatic and progressive physician. *Hans Sloane* (1660–1753) collected plants, animals, minerals, antique coins, and many other objects that became the foundation for the British Museum and later the Natural History Museum of London. *Thomas Dover* (1660–1742) made a fortune as a buccaneer and returned to practice in England thereafter and popularized Dover powder, which made him another fortune. Five physicians signed the Declaration of Independence and were prominent practitioners in their day. *Mongo Park* (1771–1806), a Scottish physician, led two expeditions into the heart of West Africa. *Thomas Young* (1773–1829) was stated to be the smartest person ever and contributed vastly to many areas of science, engineering, and numerous other fields. *Peter Mark Roget* (1779–1869) produced the thesaurus after he retired from his medical practice.

Several physicians became poets, including *John Keats* (1795–1821) and *Oliver Wendell Holmes* (1809–1894). Other writers included *Conan Doyle* (1859–1930), who created Sherlock Holmes; *Anton Chekhov* (1860–1904), the famous Russian writer; *W. Somerset Maugham* (1874–1965), whose plays were seen by tens of thousands and whose books sold in the millions; *Archibald Joseph Cronin* (1896–1981), a bestselling novelist; *Khaled Hosseini* (1965–), an acclaimed novelist and humanitarian; and *Abraham Verghese* (1955–), professor of medicine at Stanford University and the author of *My Own Country*, *The Tennis Partner*, and *Cutting for Stone*. And then there were the famous explorers: *David Livingston* (1813–1873) and *Edward Wilson* (1872–1912), Antarctic explorer, painter, and naturalist. The military leaders included *Leonard Wood* (1860–1927) and *Ernesto “Che” Guevara* (1928–1967). Other physicians were prominent in business, including *Abraham Gesner* (1797–1864), the Canadian father of the petroleum industry, and *Armand Hammer* (1898–1990), an entrepreneur, diplomat, and philanthropist. *Jules Stein* (1896–1981) was a visionary extraordinaire—and his chapter was written by our own Marvin J. Stone and his son, Rob. Athletes included *Roger Bannister* (1929), who completed the first 4-minute mile while a medical student in London. He went on to have a distinguished career as a neurologist and subsequently was the head of an Oxford College. *Henry Stallard* (1901–1973) was a 1924 Olympics middle-distance runner (1500 meters) immortalized in the 1981 epic British film *Chariots of Fire*. He went on to have a distinguished career in ophthalmology.

This is a splendid book making one proud to be a physician. Many of the authors of the individual chapters are members of the American Osler Society.

BANNING THE HANDSHAKE IN MEDICAL CENTERS

The handshake represents a deeply established social custom. In recent years, however, there has been increasing recognition of the importance of hands as vectors for infection, leading to formal recommendations and policies regarding hand hygiene in hospitals and other health care facilities (2). Such programs have been limited by variable compliance and efficacy. Regulations to restrict the handshake from the health care setting, in conjunction with more robust hand hygiene programs, may help limit the spread of disease and thus could potentially decrease the

clinical and economic burden associated with hospital-acquired infections and antimicrobial resistance. Given the profound social role of the handshake, a suitable replacement gesture may need to be adopted and then promoted with widespread media and educational programs. With the tremendous social and economic burden of hospital-acquired infections and antimicrobial resistance and the variable success of current approaches to hand hygiene in the health care environment, it would be a mistake to dismiss, out of hand, such a promising, intuitive, and affordable ban.

ANNUAL PHYSICAL EXAMINATION

The Society of General Internal Medicine argues against routine health checks (3). Despite its recommendation, an annual physical examination is the most common reason for visiting a primary care physician. During these visits, patients, physicians, and private insurers all expect a physical examination. In actuality, the value of an annual physical examination has not been tested. These annual examinations may introduce the danger of overdiagnosis. There is always a small possibility that this examination might detect some silent, potentially deadly cancer or aneurysm. Unfortunately, for the patients, these serendipitous, lifesaving events are much less common than the false-positive findings that lead to invasive and potentially life-threatening tests.

Almost nothing in the complete annual examination is based on evidence. For a generally healthy older person, the physical examination could reasonably be limited to blood pressure measurement and assessment of body mass index. As Michael B. Rothberg, MD, indicates, so many examination elements, such as testicular or thyroid exams to detect cancer, actually have evidence to recommend against them. But most simply have insufficient evidence to recommend for or against. Medicare, which has traditionally refused to pay for routine physicals, now covers an annual wellness visit. The physician exam component, however, is limited to measurement of blood pressure and body mass index. The rest of the visit includes updating medical history, testing for cognitive impairment, assessing risk factors, performing evidence-based screening (e.g., for colorectal cancer or diabetes mellitus), and providing personalized health advice.

VACCINE COSTS

Vaccination costs have gone from single digits to sometimes triple digits in the last 2 decades (4). Some physicians have stopped offering immunizations because they say they cannot afford to buy these potentially life-saving preventive treatments that insurance often reimburses poorly, sometimes even at a loss. Childhood immunizations are so vital to public health that the Affordable Care Act mandates their coverage without an out-of-pocket cost, and they are generally required for school entry. Once a loss leader for manufacturers, because they are usually more expensive to produce than conventional drugs, vaccines now can be very profitable. Old vaccines now cost more; new ones have entered the market at once unthinkable prices. Since 1986, the average cost to fully vaccinate a child with private insurance to the age of 18 has increased from

\$100 to \$2200, according to the Centers for Disease Control and Prevention (CDC). Even with deep discounts, the costs for the federal government, which buys half of all vaccines for the nation's children, have increased 15-fold since 1986. The most expensive shot for young children is Prevnar 13, which prevents diseases caused by pneumococcal bacteria from ear infections to pneumonia. Like many vaccines, Prevnar requires multiple jabs. Each shot is priced at \$135, and every child in the US is required to get four doses before entering school. Pfizer, the sole manufacturer, had revenue of nearly \$4 billion from the Prevnar vaccine line last year. Prevnar 13, which protects against 13 strains, has gone up 6% each year since it was approved by the Food and Drug Administration in 2010. There are some good reasons vaccines like Prevnar are more expensive than previous offerings. Vaccine trials, which once included thousands of volunteers, must now include tens or hundreds of thousands, as fears about side effects such as autism have grown. Additionally, some of the new vaccines are complicated to manufacture.

CIGARETTE SMOKING

According to the CDC, 18% of US adults, or 42 million, were cigarette smokers in 2012, down from 28% in 1992 (5). Smoking rates vary regionally: Kentucky, a major tobacco producer, had the highest smoking rate in the country in 2013, 30%, followed by West Virginia and Mississippi. Utah had the lowest rate (12%), followed by California and Minnesota. Smoking rates among lesbians, gays, and bisexuals are 28% compared to 17% among heterosexuals. According to Legacy, the higher smoking rates are tied to greater social stress, more frequent visits to bars, and higher rates of alcohol use. The adult smoking rate among Americans below the poverty line was 28% in 2012, compared to 17% for those above the poverty line. The smoking rate in households with annual incomes above \$100,000 is 9%.

Cigarettes cost less in heavy smoking states. The 10 states with the highest smoking rates had an average cigarette tax of 82¢ a pack in 2012, compared with \$2.42 in the 10 states with the lowest smoking rates. About 70% of American smokers say they want to quit, and about 50% try to quit every year. Many smokers indicate that they are ashamed of the habit, but kicking the habit remains tough. Only about 1 in 20 who try to quit actually succeed.

Forty-two million is still a lot of people. In some states a pack of cigarettes is now over \$10. If one put \$10 in the bank every day of the year from age 18 to 65, one would be quite well off when retiring, if still alive.

HIGH SCHOOL SMOKING

In 2013, just 16% of high school students in the US smoked cigarettes, down from 36% in the peak year of 1997, according to the CDC (6, 7). Other news from the survey of >13,000 teens: 25% of students were in physical fights in 2013, down from 42% in 1991; and 32% watched 3 hours of TV daily, down from 43% in 1999. Some of that time shifted to computers, with 41% using a computer for nonschool reasons at least 3 hours a day, up from 22% in 2003. In addition, 27%

had at least one soda a day, down from 34% in 2007; 41% of those who drove admitted to texting or emailing while driving; 2.3% had used heroin, but in some large urban school districts that usage was up to 7.4%. The share of students threatened or injured with a gun, knife, or other weapon on school property dropped to 7% from a peak of 9% in 2003. Condom use among the sexually active (about one-third of teens) was down to 59% from a peak of 63% in 2003. A once-rapid decline in cigar use has slowed, leaving cigars as popular as cigarettes with high school boys. Unfortunately, there are still 2.7 million high school students who smoke.

HIV DIAGNOSIS RATE FALLING

The US HIV diagnosis rate fell to 16.1 per 100,000 persons in 2011, down from 24.1 a decade earlier (8). The World Health Organization estimates that 35 million people globally have the virus that causes AIDS. In the US, 1.1 million people are believed to be infected. The diagnosis rate is a direct measure of when people actually tested positive for the virus. The diagnosis rates dropped even as the amount of testing rose. In 2006, the CDC recommended routine HIV testing for all Americans aged 13 to 64, saying an HIV test should be as common as a cholesterol test. The percent of adults ever tested for AIDS increased from 37% in 2000 to 45% in 2010, according to CDC data.

TOO MANY POUNDS GLOBALLY

The obesity epidemic is global: 2.1 billion people, or about 29% of the world's population, were either overweight (body mass index 26–30 kg/m²) or obese (body mass index >30) (9). The prevalence of overweight and obese people rose nearly 28% for adults and 42% for children between 1980 and 2013. In 1980, 857 million of the world's population was overweight or obese. (Obese people are also overweight, of course, but this is the terminology now used everywhere.) These data involved 183 countries. No country reported a decrease in obesity during that period! In 2013, 24% of boys and 23% of girls were overweight or obese in developed countries; in developing countries, 13% of boys and 13% of girls were overweight or obese. The number of obese people in 1913, in millions, were as follows: USA, 87; China, 62; India, 40; Russia, 29; Brazil, 26; Mexico, 25; Egypt, 24; Germany, 17; Pakistan, 17; and Indonesia, 15. Body weight is not a good thing for the USA to lead the world in.

POULTRY, PORK, AND BEEF CONSUMPTION

According to the Organization for Economic Cooperation and Development, pork (porcine muscle) is the world's most consumed meat, but in the next 5 years it is almost certain that poultry will become number one (10). By 2020, global meat consumption in millions of metric tons annually is expected to be the following: chickens, 134; pigs, 129; and cows, 75. The trend is expected to hold true for just about every region and country, developed or developing. Chicken is the cheapest and most accessible meat in the world. Both bovine and porcine meat prices are expected to well outpace prices for chicken. Poultry is also free of the sort of cultural barriers that affect

pork. Some of the world's largest chicken-eating countries per capita are those that consume almost no pork, namely Malaysia, Israel, and Saudi Arabia.

The good news is that the poultry industry is much kinder to the environment than the porcine or bovine industries. Per kilogram consumed, chicken's carbon footprint is roughly half that of pork, a quarter that of beef, and nearly a seventh of lamb. According to a spokesman of the Environmental Working Group, "If every American stopped eating beef tomorrow and started eating chicken instead, that would be the equivalent of taking 26 million cars off the road!"

A 125-POUND WOMAN DOWNS 144 OUNCES OF BOVINE MUSCLE IN 15 MINUTES

At the Interstate 40 landmark in Amarillo, Texas, the Big Texan Steak Ranch, Molly Schuyler—a professional competitive eater who this year also broke the world record for consuming huge quantities of chicken wings in a certain amount of time—ate the first 72-ounce steak dinner with all the trimmings in 5 minutes, and a second 72-ounce steak dinner with all the trimmings in <10 minutes. Amazing! I wonder how she felt the next day.

LIFE EXPECTANCY

People around the world are living longer, according to the World Health Organization (11). The average girl born in 2012 can expect to reach 73 years and the average boy, 68. That gives them an average of 6 more years of life than children born in 1990. The US does better than average, with a female life expectancy now of 81 and a male life expectancy of 76. Nevertheless, the US ranks 37th overall and does not make the top 10 for either gender. The life expectancy of the top 10 countries for females in years are the following: Japan, 87.0; Spain, 85.1; Switzerland, 85.1; Singapore, 85.1; Italy, 85.0; France, 84.9; Australia, 84.6; Republic of Korea, 84.6; Luxembourg, 84.1; and Portugal, 84.0. The top 10 countries for male life expectancy in years: Iceland, 81.2; Switzerland, 80.7; Australia, 80.5; Israel, 80.2; Singapore, 80.2; New Zealand, 80.2; Italy, 80.2; Japan, 80.0; Sweden, 80.0; and Luxembourg, 79.7.

OPTIMAL NIGHT'S SLEEP

Several sleep studies, according to Somathi Reddy (12), have found that 7 hours—not 8 hours—is the optimal amount of sleep when it comes to certain cognitive and health markers. Other recent studies have shown that skipping on a full-night's sleep, even by 20 minutes, impairs performance and memory the next day. And, getting too much sleep, not just too little, is associated with health problems including diabetes mellitus, obesity, and certain cardiovascular diseases, as well as higher rates of death. The lowest mortality and morbidity is with 7 hours! The CDC is helping to fund a panel of medical specialists to review the scientific data on sleep and develop new recommendations, probably by 2015.

A study by Kripke and colleagues (13) in 2002 tracked over a 6-year period data on 1.1 million people who participated in a large cancer study. People who reported that they slept 6.5 to

7.4 hours had a lower mortality rate than those with shorter or longer periods of sleep. In that study, 32 health factors were controlled for, including medications. Another study, also by Kripke and associates (14) in 2011, recorded the sleep activity of about 450 older women using devices on their wrist for a week. Some 10 years later, the investigators found that those who slept <5 hours or >6.5 hours had a higher mortality.

Studies based on people reporting their own sleep patterns may have some inaccuracies. Timothy Morgenthaler, president of the American Academy of Sleep Medicine and professor of medicine at the Mayo Clinic Center for Sleep Medicine, advises patients to aim for 7 to 8 hours of sleep a night and to evaluate how they feel. Sleep needs vary between individuals, largely due to cultural and genetic differences. People should be able to figure out their optimal amount of sleep in a trial of 3 to 7 days, ideally while on a vacation. An alarm clock should not be used. Go to sleep when you get tired. Avoid too much caffeine or alcohol. Stay off electronic devices a couple of hours before going to bed. These investigators advise that during the trial, you should track your sleep with a diary or a device that records your actual sleep time. If you feel refreshed and awake during the day, you've probably discovered your optimal sleep time.

The new sleep guidelines will be drawn by a panel of experts being assembled by the American Academy of Sleep Medicine, the Sleep Research Society, and the CDC. Another group, the National Sleep Foundation, has also assembled an expert panel that expects to release updated recommendations for sleep times in January 2015. These groups currently recommend 7 to 9 hours of nightly sleep for healthy adults. The National Heart, Lung, and Blood Institute recommends 7 to 8 hours. Most current guidelines say school-aged children should get at least 10 hours of sleep a night and teenagers, 9 to 10.

The average American adult sleeps 6 hours 31 minutes on an average weekday and 7 hours 22 minutes on weekends. About 70% of Americans get less sleep on workdays than they say they need. Sleeping with a partner is preferred by 60% of adults. About 20% of American adults sleep with a pet. Pajamas are worn by 73% of American adults and 12% sleep nude. A third of adults sleep with one pillow, 40% with two, and 15% with four or more pillows.

FROM BABY DIAPERS TO ADULT DIAPERS

In the past 4 years, sales of baby diapers in the US have fallen 8% and sales of adult incontinence products have increased 20% (15). Births peaked in the US at 4.32 million in 2007 and declined for 5 years before leveling off recently. Some 3.96 million babies were born in the US in 2013, up slightly from 2012. The country's fertility rate has dropped to a record low of 63 births per 1000 women of childbearing age. At the same time, >3 million Americans are now turning 65 years every year. Over the past 15 years, US sales of incontinence products have roughly tripled to around \$1.5 billion annually. Globally, sales of these incontinence products are growing at a rate of 84% annually, faster than paper-based household products. As many as 25 million Americans, or about 1 in 10 adults, have some form of urinary incontinence that can range from occasional small leaks

when they cough or sneeze to a complete loss of bladder control. While most infants and toddlers use diapers for 2 to 3 years, incontinence users typically have to buy products for much longer periods, as the problem seldom goes away. The average user spends about \$80 a month. Retiring baby boomers—Americans born between 1946 and 1964—are driving a surge in the US population aged ≥65, which is expected to nearly double to 84 million by 2050 and make up 20% of the country.

KARL FRIEDRICH MEYER (1884–1974)

My introduction to Dr. Meyer was via a recent article published in *Lancet* by Mark Honigsbaum (16). Meyer was born in Basel, Switzerland and began his research studies at the University of Basel in 1902, where he concentrated on biology, zoology, histology, and laboratory techniques. In 1909, he received a doctorate of veterinary medicine from the University of Zurich, and in 1924 during a sabbatical from the University of California, he obtained a PhD in bacteriology from the University of Zurich. His first employment was in South Africa, but in 1910 he moved to the Veterinary School of Pennsylvania, where he soon rose to full professor. There he worked on *glanders*, a bacterial disease in horses, mules, etc., which first affects the mucous membranes. It may be lethal and is dangerous to humans. He also helped elucidate the transmission of the bacteria causing a contagious abortion disease of cattle and also affecting humans via unsterilized milk, causing possibly lethal fever. This disease was called *Brucellosis*. In 1914, he moved to San Francisco and the University of California at Berkeley, where he stayed the rest of his life.

In 1950, *Reader's Digest* invited Paul De Kruif to pen a tribute to his friend, veterinarian and bacteriologist Karl Friedrich Meyer. In 1926, when Sinclair Lewis was casting around for a real-life disease detective with which to populate his novel *Arrowsmith*, it is said De Kruif suggested Meyer as the model for Gustaf Sondelius, Lewis's Swedish plague-hunter. In 1928, De Kruif, a Dutchman who had worked at the Rockefeller Institute, published *Microbe Hunters, a History of the "Great Men" of Medical Microbiology*. De Kruif called Meyer "the most versatile microbe hunter since Pasteur." He described how Meyer from his laboratory in San Francisco had gone in search of the hidden factors of a series of deadly food-borne, animal-borne, and arthropod-borne diseases. In a career spanning over 3 decades, Meyer showed that *botulism* was a highly resistant spore found in soils across the USA; that *psittacosis* or "parrot fever" was an ornithosis spread by some 50 species of birds; and that the mysterious outbreaks of "staggers" seen in horses in the American Midwest during the 1930s and 1940s were due to *equine encephalitis*, a virus transmitted by mosquitoes that bred along irrigation ditches.

Just as in the 21st century concerns about food and security, climate change, and the incursion of humans into the natural habitats have led to the recognition of new emerging infectious diseases, so in the 1930s California's rapid population growth and the incursion of settlers into valleys and deserts teeming with arthropod-bearing parasites and exotic fungi presented public health workers with new and unexpected disease

challenges. To solve these problems, Meyer ventured far from his laboratory, enlisting the aid of experts in entomology, animal ecology, and soil and climate science. At the same time, drawing on his expertise as a comparative pathologist, he had to convince often skeptical public health officials of the threat that animals, whether in the form of dairy herds (*Brucellosis*), parakeets (*psittacosis*), or ground squirrels (*sylvatic plague*), posed to human populations at a time when the importance of latent “infections” and “animal reservoirs” popularized by Meyer were not widely appreciated. This was no easy task. Thus, Meyer was an important bridge figure in mid-20th century medical research that sought to link microbial behavior to broader bacteriological, environmental, and social factors that affect host-pathogen interactions and the mechanisms of disease control.

As Honigsbaum describes, Meyer made many contributions to the burgeoning field, and one can get a sense of his methodology in changing thinking on disease from his investigation, particularly of psittacosis. Today, few people recall the hysteria about the parrot fever epidemics of the 1930s, but in the preantibiotic era, psittacosis was a disease that, like avian influenza or severe acute respiratory syndrome today, could provoke widespread panic. This was particularly the case in the US, where lurid stories about diseased Argentinean parrots were taken up by the prominent magazine *American Weekly* and the illness of the wife of a prominent US senator prompted Herbert Hoover to ban the interstate transport of lovebirds.

Although by 1930, it was known that psittacosis was transmitted by parrots, before Meyer, no one appreciated the extent to which the disease was also spread by parakeets, or that the large proportion of budgerigars bred in American aviaries harbored the “virus” (actually a small intracellular bacterium, *Chlamydia psittaci*) without displaying signs of illness. These silent infections were a particular problem in California where, during the Depression, many people supplemented their incomes by breeding budgerigars in backyard aviaries.

The urgent need for a study of psittacosis had been brought home to Meyer in December 1931, when three elderly California women had taken ill at a coffee club, dying soon thereafter. Meyer quickly established that the women had been infected by a pet budgerigar and that the bird had come from an aviary in Los Angeles. Meyer found that psittacosis was endemic to aviaries in the city, prompting the question of how the disease had been first introduced to southern California. To find out, Meyer paid a barber on a Pacific liner to bring him 200 wild shell parakeets from Australia. On arrival in San Francisco, these birds were placed in quarantine while Meyer waited to see what would happen. When one of the birds died 4 weeks later, Meyer did an autopsy. To his astonishment, he found typical lesions of psittacosis in the bird’s spleen, the same as had been observed in California budgerigars. Meyer immediately shared the information with Charles Kellaway, who was in San Francisco at the time, and on his return to Australia Kellaway alerted Frank Macfarlane Burnet, who launched his own study in which he found that psittacosis was an endemic infection of wild parakeets and had probably been enzootic among Australian parrots for centuries. Burnet, who later was

awarded the Nobel Prize, postulated that while the wild young birds were infected in the nest, these natural, mild infections could flare up under the stress of close confinement, resulting in the birds’ losing their acquired resistance and shedding the virus. By questioning importers, Meyer established that it was common practice for shippers to throw wild unbanded birds into the same pens as clean birds, greatly facilitating the spread of the virus. He concluded that in the wild these virus strains were highly adapted to their avian hosts, but conditions in shipping containers in California aviaries had greatly increased their virulence—hence, the frequent spillovers of enzootic psittacosis infections into humans.

By 1934, Meyer had tested nearly 30,000 parakeets and certified 185 California aviaries as psittacosis-free. Although he insisted that test animals at his laboratory be kept in a special isolation room and that his laboratory workers wear rubber gloves and masks at all times, the rules were not always observed. In 1935, Meyer himself breached protocol when he removed his rubber gloves to take a phone call and developed psittacosis. Meyer fortunately made a full recovery. A fascinating investigator.

ARNOLD S. RELMAN, MD (1923–2014)

Dr. Marvin Stone recently called my attention to an article in *The New York Review of Books* entitled “On Breaking One’s Neck” by Arnold Relman (17). Dr. Relman served as editor in chief of the *New England Journal of Medicine* from 1977 through 1991 and before that was a renowned clinician and investigator (in nephrology). He was professor of medicine and director of the Boston University Medical Services at Boston City Hospital and, later, chair of the department of medicine at the University of Pennsylvania School of Medicine. He also was editor of the *Journal of Clinical Investigation* from 1962 through 1967 and was a member of the Institute of Medicine of the National Academy of Sciences.

The essay “On Breaking One’s Neck” by Dr. Relman describes his hospital experiences after an accident on June 27, 2013, 10 days after his 90th birthday, when he suddenly and disastrously fell down the stairs of his home, broke his neck, and nearly died. Subsequently, he made an astonishing recovery, in the course of which he learned how it feels to be a helpless patient close to death. He also learned some things about the US medical care system that he had not fully appreciated, even though it was a subject that he had studied and written about for many years. His essay regarding his own treatment and his impressions thereof is a fascinating read. Just a few months after his injury, he began to resume his previous activities and enjoy life again.

He called his recovery astonishing, and it would never have happened without the superb emergency treatment he received at the Massachusetts General Hospital and the rehabilitative care that followed in another institution. But as he indicated, he was convinced that other factors contributed to his survival: his family support, a strong body, an intact brain, and very good luck. He also believed that his previous medical training helped because it made him aware of the

dangers of pneumonia and other infections from contamination of catheters and tubes, so he pushed to have the latter removed as soon as possible and took as few sedatives and painkillers as possible. But there was something else that helped to sustain him: he wanted to stay around as long as possible to see what was going to happen to his family, to the country, and to the health care system that he had studied so closely. Unfortunately, on June 17, 2014, about a year after his fall, he died from complications of advanced malignant melanoma (18, 19).

ALIEN SPECIES INVADING THE USA

As Bryan Walsh (20) indicates, Burmese pythons began appearing regularly in South Florida >15 years ago. It is likely pythons, brought in as pets, either escaped or were released into the wild and then like so many retirees before them, fell in love with the Sunshine State's climate. Today, as many as 100,000 Burmese pythons may be living amid the wetlands of South Florida, though no one knows for sure. Scientists have linked a drastic decline in small mammals in South Florida's Everglades National Park to the pythons, which can lay up to 100 eggs at a time, grow more than 7 feet in their first 2 years, and now face no natural predators.

The pythons are not alone. On nearly every border, the US is under biological invasion. A quarter of the wildlife in South Florida is exotic, more than anywhere else in the US, and the region has one of the highest number of alien plants in the world. There are more than 50,000 alien species in the US, where they often compete or simply eat native flora and fauna. Invasive species are probably the second biggest threat to endangered animals after habitat loss. One study suggested that invasives could cost the US as much as \$120 billion a year in damages. In Texas, *feral hogs* rampage through farmers' fields; in the Northeast, *Emerald Ash borers* turn trees into kindling; in the Great Lakes, *zebra mussels* encrust pipes and valves, rendering power plants worthless. On July 1, 2014, authorities at Los Angeles International Airport seized 67 live invasive *giant African snails* that were apparently intended for human consumption (20).

The problem seems to be getting worse (20). Most invasive species have been brought into the country by human beings either on purpose, in the case of exotic pets or plants, or accidentally with alien species hitching a ride to new habitats. During any 24-hour period, some 10,000 species are moving around in the ballast water of cargo ships. Climate changes are forcing species to move as they adapt to rising temperatures. The planet is becoming a giant mixing bowl, one that could end up numbingly homogenized as invasives spread across the globe. A biologist in Canada calls what's happening "global swarming." The balance of nature—an ideal state in which every species is in its right place—is seemingly being upended.

Life has always been on the move, but until recently that mobility was limited by oceans, mountains, and other geographic barriers. That separation allowed life to evolve into as many as 8.7 million separate species, if not far more. But then *Homo sapiens* arrived. As humans spread around the globe, they

brought their favorite plants and animals with them, along with stowaways like black rats, which originated in tropical Asia before infesting the planet from the holds of sailing ships.

For a long time there was little concern about the effects of introducing alien species to new ecosystems; they were sometimes even sought after. It is not surprising that the growth of invasive species has closely followed the growth of global trade. As canoes and clippers gave way to container ships and jumbo jets, it became easier to move species around the globe. The sheer speed in which things move around the planet gives species coming from one part of the planet a much better chance to arrive alive, happy, and ready to reproduce in another part. Since the St. Lawrence Seaway was opened in 1959, oceangoing vessels have been able to sail into the lakes, bringing alien species with them. That is how the zebra mussel, one of the most tenacious aquatic invasives, found a home in the Great Lakes. There are now millions of the mussels in the Great Lakes; clusters encrust anchors and docks and disrupt the marine food chain. Zebra mussels can grow so plentiful that they block the intake valves of power plants and industrial facilities, causing hundreds of millions of dollars in damage. The mussels take all the plankton out of the water, pulling the rug out from under the entire ecosystem.

The reality is that we already live in a deeply invaded world. Alien species are everywhere. Almost all of the grasses in American lawns come from somewhere else, including Kentucky Blue Grass. More than one-quarter of the plants in Vermont and more than one-third in Massachusetts come from outside those states (20).

Invasive plants and animals have flocked to Florida for some of the same reasons that more than 600 people a day move there: the sunny climate, the plentiful land, and a generally welcoming attitude toward newcomers. And like the new human arrivals, invasive wildlife enters the state through the sprawling Miami International Airport, which ranks first in the US in international freight shipments and live-animal traffic, with about 3000 live wildlife shipments every month. While border control officials check cargo for invasive species, the sheer number of alien species entering Florida on any given day and a climate that seems designed to turbocharge the growth of anything living tilts the odds in the species' favor.

Invasion biology has become a sprawling discipline with its own journals, academic centers, and graduate programs (20). Just because a plant or animal is alien does not automatically mean it will become a dangerous invasive. But all else being equal, it is better for nature if species stay at home, and it is worth spending billions of dollars worldwide to prosecute a war against aliens. Even though the spread of invasives can actually lead to an increase in local diversity, North America has an estimated 20% more species now than it did before European colonization. On a global scale, unchecked invasions can lead to planetary homogenization. Just as global trade has allowed megabrands like Wal-Mart and McDonald's to spread around the world, crushing local mom and pop shops, human activity has allowed jellyfish and Argentine ants to invade new territory, displacing natives along the way.

Human beings, of course, have become the dominant force on the planet, so much so that many scientists believe we have entered an entirely new geologic epoch: *the Anthropocene*. We have already been shaping the planet unintentionally, through greenhouse gas emissions and global trade and every other facet of modern existence. The challenge now is to take responsibility for that power over the planet and use it for the right ends. There is one species that can claim to be the most dominant invasive of all time. From its origins in Africa, this species has spread to every corner of the world and every kind of climate. Everywhere it goes, it displaces natives, leaving extinction in its wake, altering habitats to suit its needs, with little regard for the ecological impact. Its numbers have grown nearly a million-fold and its spread shows no sign of stopping. That invasive species of course is us!

BUNDLED HOSPITAL PAYMENTS

Traditionally, hospitals have charged patients separately for every service and supply they use (21). Fees for surgeons, anesthesiologists, and other providers come in complex bills of their own. Now, more hospitals see so-called “bundled” payments as the wave of the future. In bundled care, patients or insurers are charged one overall price for everything involved in, say, a hip replacement or coronary bypass—from the preoperative tests to postoperative care, for as long as 120 days after the surgery. If the hospital delivers that care for less than the stated price, it keeps the savings. If complications occur and the patient needs more care, the hospital absorbs the extra cost. Proponents say bundled payments, unlike fee-for-service billing, provide strong incentives for physicians and hospitals to work together to keep costs and complications low. Patients and insurers also know upfront what care will cost, which is usually much less than the sum of all those separate bills. The concept began with heart surgery and joint replacement and is expanding to cancer care and chronic conditions, such as diabetes mellitus. According to Melinda Beck, some 350 health care organizations are participating in pilot bundled-payment programs with Medicare, covering 48 health conditions. Several states are experimenting with bundles in their Medicaid programs.

Promising to deliver quality care at a specific price does put physicians and hospitals at risk, so agreeing on what the bundle includes and how to price it is critical. Geisinger Health System, a bundling pioneer, redesigned its procedures and eliminated unjustified variation in care, and outcomes improved and costs decreased. In its first 2 years, Geisinger’s coronary bypass bundle decreased costs by 5% and reduced the mortality rate by 67%. Its perinatal program reduced the rate of Cesarean sections by 36% and the average stay in the neonatal intensive care unit by 1.5 days. To date, however, the only health plan using Geisinger’s care bundle is its own, a nonprofit health maintenance organization with nearly 450,000 members. Commercial insurers have been slow to embrace bundled care because it requires them to process claims differently. More than 100 hospitals initially involved in Medicare’s pilot program decided not to continue, mainly due to administrative issues. Bundled payments pose significant challenges—including how

hospitals should set prices, manage costs, distribute savings, and get physicians to think about delivering integrated care, rather than isolated care.

INTERNAL MEDICINE FELLOWSHIPS

The percentage of internal medicine specialty fellowships filled for positions starting in July 2014 were the following: cardiovascular disease, 99.6%; pulmonary disease/critical care, 99.4%; gastroenterology, 98.0%; hematology/oncology, 97.1%; rheumatology, 91.7%; endocrinology/diabetes and metabolism, 91.2%; infectious disease, 77.4%; nephrology, 75.9%; and geriatric medicine, 42.1%.

GRADUATE MEDICAL EDUCATION

As Chandra and colleagues (22) pose it, “A central health care–related policy question for the United States is whether the federal government’s role in financing graduate medical education (GME) increases the number of physicians trained and influences their specialty choices by subsidizing the cost of training.” As these authors indicate, total federal GME funding amounts to nearly \$16 billion annually. Medicare’s contribution to GME is \$9.5 billion, nearly \$3 billion for direct medical education to pay the salaries of residents and supervising physicians, and about \$6.5 billion for indirect medical education to subsidize the high cost that hospitals incur when they run training programs. Federal Medicaid spending adds another \$2 billion for GME, and an additional \$4 billion comes from the Veterans Health Administration and the Health Resources and Services Administration. States support GME through nearly \$4 billion in Medicaid spending. These authors argue that direct medical education funding does little to offset the training of physicians; residents essentially pay the full cost of their training, while the direct medical education program simply transfers money to recipient hospitals. Indirect medical education is more controversial in terms of both the accuracy of the costs that are reimbursed and the underlying concept: paying institutions more because they spend more, rather than because they provide higher value. Such cost-based reimbursement runs counter to the direction that health care reimbursement is heading.

If the policy goal of federal funding for GME training is to alleviate physician indebtedness or to encourage more medical school graduates to go into primary care practice, other strategies may be more effective, such as offering selective loan forgiveness or vouchers to offset tuition for trainees who opt for careers in primary care. Such strategies, these authors argue, directly benefit the recipient physician instead of the training institution. Alternatively, if the current training system is not preparing residents adequately to practice using team-based strategies or to focus efficiently on improving health care outcomes, GME monies could be targeted for activities directed toward these goals, with appropriate metrics verifying the outcomes of the training.

WASHINGTON LOBBYING

From 1999 through 2013, 20 different interest groups or individual firms spent at least \$150 million to influence Congress

and executive branch agencies (23). The biggest spender was the US Chamber of Commerce, spending \$1,066,810,680; number 2 was the American Medical Association, which spent \$306,077,500; the American Heart Association was number 5, with \$259,177,661; number 6 was the Pharmaceutical Research and Manufacturers of America, with \$255,146,420; and Blue Cross Blue Shield was number 8, at \$231,835,532. The totals for the US Chamber were not limited to what was spent to lobby federal officials, but also included spending to influence state and local governments. The biggest spenders in 2013 included pharmaceuticals/health products, \$226,114,456; followed by insurance, oil, and gas, computers/Internet, electric utilities, and TV/movies/music. These lobbying expenses do not include political donations to various candidates.

THE ATHENA DOCTRINE

The subtitle to this book by John Gerzema and Michael D'Antonio is "How Women (and the Men Who Think Like Them) Will Rule the Future" (24). These authors surveyed 64,000 people in 13 nations; two-thirds said the world would be a better place if men thought more like women. The sentiment was the same across the planet: "We've had enough of the winner-takes-all masculine approach to getting things done; it's time for something better."

In 2010, these authors wrote the book *Spend Shift*, and during the year afterwards they traveled the country and heard from many people who agreed with the thesis that a quiet revolution had taken place in "the way we buy, sell, and live" and applauded how individuals, families, businesses, and organizations were adapting to tougher economic conditions. These authors stressed the theme of adaptation and not merely survival because they saw that the effects of the "Great Recession" that began in 2008 would not be reversed quickly. Despite low interest rates, government spending, government cutbacks, and bank bailouts, full recovery seemed elusive. A growth did return, of course, to the US economy, but its pace was anemic and the previously high employment rates have not returned. Although the immediate insights offered in *Spend Thrift* were clear, these authors learned more as they presented them to audiences around the world and began to notice something they had not fully appreciated. Most of the traits exhibited by the successful entrepreneurs, leaders, organizers, and creators whom they profiled seemed to come from aspects of human nature that are widely regarded as feminine. That was not to say that these innovators were mainly women—indeed, they were not—or that they believed that human equality belonged primarily to one gender or the other. It was simply that time and again these authors heard people say the skills required to thrive in today's world—such as honesty, empathy, communication, and collaboration—come more naturally to women. The authors decided that they needed to conduct research to discover how people in various parts of the world define traditionally masculine and feminine traits. Then the authors had to discover if the feminine qualities were more highly valued. If the answer turned out to be yes, then they could search for case studies to show that the trend worked in the real world.

To better define masculine and feminine, the authors sampled 32,000 people to classify 125 different behavioral traits as masculine, feminine, or neither. They chose words like *selfless, trustworthy, curious, and kind* from previous empirical studies in behavioral psychology and gender-related research. They found a strong consistency across countries in what was perceived as feminine, masculine, or neither. Some words defining masculine included *rugged, dominant, strong, arrogant, rigid, leader, analytical, proud, decisive, ambitious, overbearing, hardworking, logical, aggressive, brave, daring, competitive, gutsy, stubborn, assertive, driven, and direct*. Words defining feminine included *free-spirited, charming, trustworthy, articulate, reliable, dedicated, dependable, reasonable, nimble, adaptable, obliging, healthy, popular, passive, committed, helpful, creative, flexible, intuitive, social, sincere, passionate, kind, supportive, giving, good listener, gentle, vulnerable, emotional, involved, friendly, selfless, empathetic, understanding, patient, poised, and trendy*. After defining their terms, the authors developed a statistical model for how masculine and feminine traits related to solving today's challenges. After getting the data, they saw that across age, gender, culture, and country, feminine traits correlated more strongly with making the world a better place than did masculine traits.

The authors found that many of the qualities of an ideal modern leader are considered feminine. We seek a more expressive style of leader, one who shares feelings and emotions more openly and honestly. Across the globe, societies want those in power to connect more personally—an understandable response to the hidden agendas and tightly wound power circles often associated with men. They found that an ideal leader must be a long-term thinker who plans for the future to bring about sustainable solutions, rather than posturing for expediency. The qualities of being decisive and resilient (identified as more masculine) are both important, but the definition of "winning" is changing. It is becoming a more inclusive construct rather than a zero-sum game. In a highly interconnected and interdependent economy, masculine traits like aggression and control, which are largely seen as "independent," are considered less effective than the feminine values of collaboration and sharing credit. They found that being cause-focused rather than self-focused was a more valued leadership trait. This perhaps indicated that being loyal (feminine) was more important than being proud (masculine). We want our leaders to be more intuitive, more understanding of others' feelings, and more able to access various angles of a problem or consequences of an action before taking action. They also found that being flexible is an essential modern skill. It permits people to listen, learn, and build consensus to get things done. They found that over 80% of their respondents said that relationships and respect of others count more toward success than money. When they explored the concept of morality, they found that it was strongly associated with loyalty, reason, empathy, and selflessness—all feminine traits. The value placed on this trait reflects society's outrage over the greed, corruption, and self-interest of our times.

They found that in every country respondents were most in agreement when it came to linking feminine traits and values

to happiness. Again, many of the same virtues such as patience, loyalty, reason, and flexibility underscored the emphasis on adapting to a new world. They found that knowledge and influence were replacing traditional materialistic status symbols driven by masculine concepts of power and esteem. They found that none of the most highly masculine traits (rugged, aggressive, dominant, brave, arrogant) were among the most valued when it came to being either a great leader or a more moral or happy person. Those masculine attributes that did register as important to leadership, morality, or happiness—decisive and confident—fell toward the bottom of the rankings for what it means to be masculine.

It is the age of Athena!

MEGACITIES

There are now 30 cities on planet Earth with populations of ≥ 10 million: Tokyo has 38 million; Delhi, 25; Shanghai, 23; Mexico City, 21; San Paulo, 21; Mumbai, 21; Osaka, 20; Beijing, 20; New York, 19; Cairo, 18, Dhaka, 17; Karachi, 16; Buenos Aires, 15; Kokata, 15; Istanbul, 14; Chongqing, 13; Rio de Janeiro, 13; Manila, 13; Lagos, 13; Los Angeles, 12; Moscow, 12; Guangzhou, 12; Kinshasa, 11; Tianjin, 11; Paris, 11; Shenzhen, 11; London, 10; Jakarta, 10; Seoul, 10; and Lima, 10. Of these megacities, only two are located in the US, six are in China, and three in India (25).

Eight of the 30 largest cities are in countries that the World Bank defines as high-income. By 2030, the United Nations projects that only 4 of the 30 largest cities will be in nations viewed as high income: Tokyo, Osaka, New York, and Los Angeles. In 1950, New York was the largest urban area in the world, with just over 12 million residents. Now, it has nearly 19 million but ranks only ninth. In 1950, only New York and Tokyo had more than 10 million people.

KEVIN DURANT

What a guy! He saluted his mother while accepting the National Basketball Association's *Most Valuable Player* award in May 2014 (26). Durant responded to the trophy presentation by talking about how much his mom sacrificed, moving the family from apartment to apartment and working long hours to make ends meet. Yet, she always found time to tell her sons that she loved them. She was, said Durant, at his games and his practices and involved in his life in ways that money couldn't cover—in ways that only a mother's heart could provide. He fought back tears as he detailed many of those tough moments. He declared that his mother, Wanda Pratt, was "the real MVP." Her son's teammates and fans gave her an emotional standing ovation. In Durant's case, he is all too aware of what his mom selflessly endured to make him a responsible man as she fought the odds of raising a family alone in Washington. "We weren't supposed to be here," a sobbing Durant said. "You made us believe, and kept us off the streets, put clothes on our backs, and food on the table. When you didn't eat, you made sure we ate. You went to sleep hungry. You sacrificed for us." What a guy and what a mother!

GARRISON KEILLOR

A *Prairie Home Companion* is the live radio variety show founded and hosted by Mr. Keillor 40 years ago (27). He is a storyteller extraordinaire and his latest work, *The Keillor Reader*, is a treat. Some brief quotes: "Half of all people are below average." "Whoever increases knowledge, increases sorrow." "The rivers run into the sea and yet the sea is not full." "The race is not to the swift nor the battle to the strong nor riches to men of understanding, but time and chance happeneth to them all."

SAFEST FORM OF TRANSPORTATION: THE AIRPLANE

In 2013, out of 36.4 million flights, there were 81 accidents and 210 fatalities, down from 90 accidents and 685 fatalities in 2009, according to the International Air Transport Association.

ADVICE FROM A CURMUDGEON

In 2014, Charles Murray, PhD, published *The Curmudgeon's Guide to Getting Ahead: Dos and Don'ts of Right Behavior, Tough Thinking, Clear Writing, and Living a Good Life* (28). I believe this is Dr. Murray's 15th book. Charles Alan Murray (born 1943) is an American paleo conservative and a paleo libertarian-leaning political scientist, author, columnist, and pundit currently working as a fellow at the American Enterprise Institute, a conservative think tank in Washington, DC. He is best known for his controversial book *The Bell Curve*, coauthored with Richard Herrnstein in 1994, which argues that class and race are linked with intelligence. He first became well known for his book *Losing Ground: American Social Policy 1950–1980*, which appeared in 1984 and discussed the American welfare system. His articles have appeared in *Commentary Magazine*, *The New Criterion*, *The Weekly Standard*, *The Washington Post*, *The Wall Street Journal*, and *The New York Times*. Dr. Murray was born in Newton, Iowa, and because of his high SAT score was accepted into Harvard University, where he graduated in history in 1965. His PhD was received in 1974 from Massachusetts Institute of Technology in political science.

The latest book, *The Curmudgeon's Guide to Getting Ahead*, is written mainly for young people who have recently graduated from college or have just received some type of postgraduate degree, and he advises on how to get ahead in life and how to have a happy one. The book is divided into four basic sections with anywhere from 6 to 13 chapters under each section. The first major section, entitled "**On the Presentation of Self in the Workplace**," has the following titles: Don't suck up; Don't use first names with people considerably older than you until asked, and sometimes not even then; Excise the word *like* from your spoken English; Stop "reaching out" and "sharing" and other prohibitions; On the proper use of strong language; On piercings, tattoos, and hair of a color not known to nature; Negotiating the minefield of contemporary office dress; Office emails are not texts to friends; What to do if you have a bad boss; The unentitled shall inherit the earth; Manners at the office and in general; Standing out isn't as hard as you think. Under the heading "**On Thinking and Writing Well**" are the following chapters: Putting together your basic writing tool kit; A bare bones usage primer; Writing when you already know what you

want to say; Writing when you don't know what you want to say; Don't wait for the muse; and Learn to love rigor. **"On the Formation of Who You Are"** has the following chapters: Leave home; Recalibrate your perspective on time; Get real jobs; Confront your inner hothouse flower; Think about what kind of itches need scratching; Being judgmental is good and you don't have a choice anyway; Come to grips with the distinction between *can do* and *may do*; Come to grips with the difference between being nice and being good; Don't ruin your love affair with yourself. In the section **"On the Pursuit of Happiness"** are the following chapters: Show up; Take the clichés about fame and fortune seriously; Take religion seriously especially if you have been socialized not to; Take the clichés about marriage seriously; Be open to a start-up marriage instead of a merger marriage; Watch *Groundhog Day* repeatedly; and That's it! Try hard. Be true. Enjoy. Godspeed.

I love this book and I think we all can get a good deal from it.

WILLIAM CLIFFORD ROBERTS, MD
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