1

DISAPPEARANCE

in which we pose a sociological thought experiment;
and discuss its intellectual roots, parameters, limitations
and opportunities

"What if medicine disappeared?" I blurted.

"Disappeared?" Fran repeated the question. "What do you mean?"

I was trying to imagine what the world would look like without Western medicine. Gone would be primary care physicians, surgeons, psychiatry—all the various medical specialties. There would be no treatment for trauma, nor fractures. Sufferers from the common cold would need to recover without their physician's help. There would be no blood transfusions or organ transplants, nor would there be emergency or critical care of any sort. Pharmaceutical companies would be gone, as would the drugs they manufacture—as would the placebo effects from those drugs!

Perhaps it was the wine—a favorite bottle from the Rhone Valley—that stimulated my question. Or maybe it was the spring air. Fran and I were just finishing a lovely pasta and homemade pesto dinner on our deck, our table framed by pots of bright red geraniums. As though on cue, a huge heron had flown by moments ago, its wings pumping air in slow motion. In the dusky eve, tree frogs began their noisy chant.

Less poetically, it might have been an editorial in the *New England Journal of Medicine*.

To mark the beginning of the third millennium, the editors of that prestigious, Harvard-based journal, had looked back on medicine's history. We didn't take too seriously their claim that "medicine is one of the few spheres of human activity in which the purposes are unambiguously altruistic." That type of self-serving ideology is pretty typical of any profession—our own included—and easy to dismiss. What got us thinking was the entire point of the editorial—that the history of medicine is a story of progress and great good, that over and above all, the efforts of medicine save lives. "It is hard not to be moved," wrote the editors, "by the astounding course of medical history over the past thousand years."[1]

Who among us, physician or patient, would question medicine's beneficence? Three hundred years ago, Samuel Johnson wrote of medicine that it was the "greatest benefit to mankind," a quotation which is also the title of a recent history of medicine by an eminent historian.[2] Much has changed in the centuries since Johnson. Almost everything about the profession and practice of medicine has changed. But the notion of medicine's beneficence has not.

Earlier that day, we had both read the editorial. We thought about it and expressed some skepticism. But as often happens, we talked around the issue without direction, letting it drift away.

"What if medicine disappeared?" Fran repeated my question. "Probably nothing would happen," she answered with an enigmatic smile.

"Nothing?"

I knew what she did not mean. Were it to vanish, the medical establishment would not go unnoticed. It's a huge part of our economy and our labor force. We spend $1.4 trillion per annum, roughly 15% of the gross domestic product, which comes out to more than $5,000 per capita, double what it was ten years ago. There are 800,000 physicians (up from 300,000 in 1970), 1.5 million registered nurses (double the number from 1970), and about 200,000 pharmacists. In all, our nation has more than four million health professionals.

"What I mean is this, that if medicine disappeared, it wouldn't have much impact on illness and death."

I looked at her.

"Maybe some," she relented, "here and there." She took the last sip of wine. "But overall, I don't think much would happen if medicine disappeared."

The wine was gone. With the darkening, the tree frogs' song turned shrill. Mosquitoes circled, smelling our blood.

After a night of strange dreams, at least for me, we continued talking.

"If medicine disappeared," Fran said, "there are some things we wouldn't miss."

"Such as . . . "

"Such as fatal reactions to prescription drugs."

A trip to the library revealed some amazing stuff.

In 1999, there were in hospitals about two million serious adverse reactions to correctly prescribed drugs, which killed an estimated 106,000 patients, amazingly, the fifth leading cause of death in the United States.[3] By comparison, all accidents in 1999 killed 98,000 people. Lives are undoubtedly saved in hospitals, but they are also needlessly lost there. It seemed that my lifelong fear of hospitals was actually justified.

"What about people who die from infections they get in hospitals," asked Fran.

Back and forth I traveled again to the library, examining 1999 statistics. I learned that so-called nosocomial (hospital acquired) infections afflict about 6% of all hospital admissions, costing an additional $4.5 billion per year in health care expenses, and causing 88,000 deaths—the sixth leading cause of deaths, ahead of diabetes which killed 68,000.[4]

"It many seem a strange principle to enunciate, as the very first requirement in a hospital," Fran was quoting Florence Nightingale, "that it should do the sick no harm."

A day later, Fran handed me a report issued by *The Institute of Medicine,* titled "To Error is Human." The report asserted that medical errors kill between 44,000 and 88,000 people per year (the sixth to the eighth leading cause of death), more than killed by automobiles.[5] Most errors involved the inappropriate administration of medication. Several medical experts challenged the study, claiming that the findings were grossly exaggerated. Yet research in 2002 corroborated the estimate, claiming that "fully 34% of all doctors said that either they or members of their family had experienced serious medical errors . . . with serious health consequences."[6]

Nor is our list complete. To our consternation we learned about surgeries that should never have been performed. In 1974, the U.S. House of Representatives estimated that there were 2.4 million unnecessary operations—a large proportion of them gynecological, resulting in 16,000 deaths and an expenditure of $3.9 billion.[7]

It took us a moment to make the calculation. Taken together, the four medicine-induced problems—adverse reactions to drugs, nosocomial deaths, medical errors, and unnecessary surgery—account conservatively

for about a quarter million deaths per year (about one per minute in the United States), about 11% of all deaths. Unbelievably, these medicine-induced problems would be the third leading cause of death, behind cancer but ahead of strokes—though neither alone or together are any of these medicine-induced deaths ever shown in official statistics.

Two nights later we were at our favorite Mexican restaurant, both of us eating entrees that were fried and cheesy.

"So tell me this: How would you evaluate what happened after this supposed disappearance of medicine?" Fran asked me.

"I'm thinking in terms of life or death," I replied, sounding quite dramatic. I took a bite of my chile releno, trying not to imagine my body's response to all the cholesterol that was moving via fork from my plate to my innards. Beginning tomorrow, I pledged to eat more tofu! And to exercise! And to floss! "What I want to know is this: If medicine disappeared, how would it affect mortality?"

"Why just mortality?"

I took a deep breath to compose an answer, but she beat me to it. "Because other ways of thinking about health, such as quality of life, are just too vague, too difficult to assess."

I nodded.

"So you ignore the treatment of pain?"

"Not in real life," I asserted. My wife knew that I had a very low tolerance for pain. "But, for now, yes. Even illness is difficult to assess," I added. "Who knows when someone gets sick or returns to wellness."

"It means, just as one example, that you don't consider the successful treatment of diabetes."

"Sure, I do. But only as it relates to life or death." Sticking to mortality may be a narrow way of looking at things, a laser more than a beam of light. But it had the potential to be revealing.

A day later I showed Fran a quote by Hermann Biggs, founder of New York City's pioneering Bacteriological Diagnostic Laboratory, in 1911, it summarized my argument. "The reduction of the death rate is the principal statistical expression and index of human social progress.[8]

I figured that not much had changed since then. Mortality was and still is the best way to measure the progress of medicine, and yet the physician's task as healer does—and ought to—go far beyond any single way of assessing outcomes.

"What about emergency treatment for accidents?" I asked aloud a few days later. "Without medicine, would a lot of people die?" It occurred to me that our marital conversations had become strange.

"It's hard to know," Fran replied a moment later, "because you can't do any controlled studies."

I nodded. In most spheres of medicine, new practice is certified through carefully designed clinical research. But it's hard to imagine a control group of patients (who get no treatment) in the emergency room, and its even harder to imagine a randomized "double-blind" design (in which neither the patient nor the physician knows who has or has not received treatment).

The next day, we met after work for dinner at our favorite bistro.

"Did you know that the homicide rate declined between 1960 and 2000?" asked Fran.

I looked at her without comprehension. Since I was more interested in addressing my low blood sugar than understanding this turn of conversation, I began to study the menu board.

"But during the same time aggravated assaults with firearms tripled." She paused, waiting for me to say something. "So more people get shot, but fewer die. What's the explanation?"

"Bad aim?" I guessed. I decided to order the whitefish Grenoble. Suddenly it occurred to me. "Shootings increase, but mortality from shootings decreases. It must be the emergency system. There's really no other explanation possible."

Fran smiled. "Mortality from gun assaults has fallen from 16% in 1964 to just 5% at the millennium."[9]

It's like a natural experiment which demonstrates indirectly a substantial improvement in mortality from emergency medicine.

"It's probably the 'chain of survival,'" I proclaimed, "which means that it's not really physicians . . . "

Here we cannot get one hundred pages ahead of our story. The point had been made. Were emergency medicine to vanish, it appears that more gunshot victims would die—and, we presume, many others with different injuries and traumas would perish as well.

WHY WE DIE

Given our focus on mortality, it is appropriate to begin with an examination of why we die. We all know the litany. The leading cause of death in 2000 was heart disease (30%),[10] followed by cancer (23%) and strokes (7%).[11] The public assumes without question that medical intervention is effective in diagnosing and treating these diseases—and that as a result

we live longer. In the chapters that follow, we'll cast considerable doubt on these assumptions and suggest the way that we look at illness and health is wrongheaded. Which leads us to . . .

A remarkable article that was published in the *Journal of the American Medical Association* (*JAMA*) in 2004. The authors were from the Center for Disease Control and Prevention in Atlanta, a division of the National Institutes of Health (NIH); they were held in the highest regard by the biomedical community. They asked a crucial and generally ignored question: What "actually" causes one to die of heart disease or cancer, or any of the other leading causes of death?[12]

Their answer? The leading "actual cause of death" is tobacco (18%)!

The implications of this finding for personal health and for health care policy are immense. For example, standard medical practice focuses considerable resources on the diagnosis and treatment of lung cancer with very little success. Five year survival rates are about 13%, a figure which unfortunately has not improved in several decades. In an accompanying editorial titled, "The Immediate vs the Important," two physicians, themselves authors of a groundbreaking 1993 article on the same subject, called for a different approach for treating lung cancer. We must begin with the realization, they wrote, that "lung cancer is merely the natural pathologic consequence of exposure to tobacco use." Our ability to eliminate this fearsome disease "will remain constrained until focus and resources are directed to the root causes of these conditions."[13] In other words, lung cancer can be prevented; once contracted, its treatment is most difficult.

According to the *JAMA* article, the second leading "actual cause of death" is obesity (16%).

This is not only a serious problem, but one that is growing rapidly. "Our estimates," the authors explained, "indicate an increase of 76.6% over the 1991 estimate of overweight attributable deaths." In addition to excessive eating, "poor diet and inactivity cause an additional 15,000 deaths per year." By the year 2020, the authors project the leading actual cause of death in the United States will be obesity.

That smoking and obesity account for more than one in three deaths should redirect the teaching of medicine, the considerable efforts of our health care system, and change the very nature of medical practice, for, as we shall see in chapter 8, physicians still give little attention to what are somewhat dismissively called "lifestyle" problems.

THOUGHTS ABOUT THE EXPERIMENT

A few days later conversation about the thought experiment resumed, this time in the car.

"I admit that it's an interesting idea," Fran said, "but there's something suspicious about it." She paused. "It seems like it's just an analytical game."

"A serious game," I replied. The light turned red.

"Because to state the obvious," she continued, ignoring my comment, "medicine is not going to vanish."

As fate would have it, at that very moment we drove by a church, a modest structure with a sign board in front that each week featured a new religious sound bite. "*Imagination Can Be A Dangerous Thing*," it proclaimed.

We shook our heads. Perhaps that's true, but I prefer the inestimable John Keats, who wrote about the "truth of imagination."

"What I'm hoping is that we can use the 'truth of imagination' to evaluate medicine's role in our health."

"Yeah, sure," she said, a double positive that comes out negative. "Let me ask another question: After this disappearance, what exactly would remain?"

"That's the same as asking me exactly what would disappear."

"Exactly."

It's a difficult question, which, at its heart, involves establishing the boundary—what is inside and what is outside—of Western medicine. The problem is akin to determining, and to maintaining, a political border. There have been frequent wars in medicine's history, and occasional peace treaties, in either case altering a hitherto unquestioned border. What was on one side is now on the other. Maybe the best solution to our problem is to think of what is inside the boundary as the routine practice of medicine, which we would call "MD medicine."[14]

The following afternoon, as Fran was tending to her garden pruning, deadheading, fertilizing, and most of all, admiring her peaceable queendom, we decided that osteopathy, once the bitter enemy of standard medicine, has today become its partner; for our thought experiment, it is part of MD medicine and therefore must be expunged. Chiropractics, on the other hand, is still outside standard practice—even though many insurance companies reimburse its services. We

debated acupuncture. It is offered at our local hospital's "Center for Integrative Medicine." Yet it still seemed to us sufficiently outside MD medicine that it would not disappear.

The whole issue of alternative medicine—what its boundaries are and who are its practitioners—is vexing, and problematic for our thought experiment. We talked about an illustrative story.

In 1976, the then Director of the Mayo Clinic Comprehensive Center, Charles Moertel, made a startling disclaimer in *JAMA*. A very dangerous drug, 5-Fluorouracil (5FU), commonly used in chemotherapy for colon cancer, did not—as purported—reduce mortality. "One can only hope," he wrote, "that the good judgment of the American physician will dissuade him from treating thousands of postoperative colon cancer patients with this toxic drug in the misinformed belief that it will provide them with therapeutic benefit."

Two years later, in *The New England Journal of Medicine*, Moertel still maintained that 5FU had no clinical value. Yet he called for continued clinical research on the drug, offering this remarkable conclusion: "Patients and their families have a compelling need for a basis of hope. If such hope is not offered, they will quickly seek it from the hands of quacks or charlatans."

Moertel's assertion was shocking and disturbing.

"We should stop deceiving patients," another physician replied in response: "To do less is to be a charlatan or a quack."[15]

If a quack is one who knowingly gives worthless medicine, then Moertel (along with many other physicians) must be one—a (somewhat facetious) judgment I shared a year later at a symposium I organized at the *American Association for the Advancement of Science*.[16] One panelist, a prominent historian from Emory University, who had written widely on quackery, disagreed. Moertel cannot be a quack, he asserted, because he is using the scientific method in an attempt to advance medicine. In other words, MD medicine cannot by this particular definition be considered illegitimate.

Well, perhaps.

In the years that have passed, we have stopped using the term "quack," except in cases of obvious fraud. Other terms, ones which do not prejudge, better describe those who practice outside the generally approved boundaries of contemporary medicine. But the problem remains: How do we tell who is who and what is what? It's an issue that's still debated.

What ever is meant by alternative medicine, there is no doubt about its widespread use. According to a 1997 survey of the United States, more than four in ten Americans used some form of alternative therapy, an increase from one-third in 1990. Estimated expenditures for alternative medicine professional services increased 45% from 1990 to 1997 and were conservatively estimated at $21 billion in 1997, with at least $12.2 billion paid out-of-pocket. *This exceeds the out-of-pocket expenditures for all U.S. hospitalizations*. Total 1997 out-of-pocket expenditures relating to alternative therapies were conservatively estimated at $27 billion, *comparable to the out-of-pocket expenditures for all U.S. physician services.*[17]

Readers interested in the definition and scope of alternative medicine may consult appendix A. Suffice it to say, for this book, alternative medicine is not seen within the scope of MD medicine.

"What about public health?" asked Fran, changing the subject, just as she crushed a Japanese beetle.

"It has some shared history with medicine," I noted, "and its ultimate goal is similar. But," I listened to myself arguing both sides, "public health professional training is quite different from what physicians get."

A Baltimore Oriole sang to us from a nearby treetop. We craned our necks, but could not find it.

"Its focus," said Fran, "on the whole population, rather than the individual, is fundamentally different." After a moment she added: "In public health, an effect of five deaths per thousand is, and should be, quite significant. But the practicing physician sees one patient at a time. So it's yes or no, rather than a probability equation."

We decided that public health was outside of standard MD medicine and therefore would remain even as medicine disappeared.

The problem of what stays and what disappears is perhaps not as difficult as we first thought. Our criterion of success is mortality. Whether or not the chiropractic or physical therapy or myriad other practices are effective, they have a minimal impact on life or death.

Our previous examples were like foreign wars. But civil wars, that is internal debates within medicine itself, are quite common. The tonsillectomy that I had as a child is no longer done routinely. For two examples since the millennium, hormone replacement is no longer routinely recommended for menopausal women, nor are bone marrow transplants seen as efficacious treatment for breast cancer.

A week later we were still discussing the boundary issue.

I had been wondering how to handle the placebo effect and the whole panoply of mind-body medicine, all of which interested me greatly.

"Most of what we know about placebos comes from clinical trials," Fran pointed out. "If clinical trials disappear, then so does our knowledge, and our understanding, of placebos."

"Sure, that's true. But wait a minute." I found a book, the latest collection of research on placebos, in our study. It took me only a moment to find the quote I was looking for. Most clinicians tolerate placebos "as a necessary nuisance" but otherwise "considered them with contempt,"[18] I read to Fran.

Back and forth we went, often changing sides in the argument. Finally we concluded that the placebo effect, and more generally all of mind-body medicine, has become integrated (if barely) into modern medicine and therefore would disappear.

Extended conversation about boundaries made us realize how, unlike political boundaries, which are lines (or barriers) that one can see and know the instant one has crossed them, the ones that surround medicine are imprecise. This is a problem not unfamiliar to sociologists. Important terms like "middle class" are notoriously difficult to define. Even in medicine, the very fundamental concept of "life" is controversial, that is, to say difficult to define, as witnessed by the fierce debates over abortion and stem cell research, not to mention end-of-life issues.

It's not just doctors and their procedures that would disappear," Fran pointed out. "It's a whole way of thinking about health and illness."

I nodded. Medical practice is more than a set of procedures and techniques. It is directed by a powerful ideology that guides the way physicians think and act. This so-called medical model is based on six assumptions about the body and the nature of disease. I ticked them off in my mind.

First, the concept of health is not defined at all; instead, as in the World Health Organization's definition, it is assumed in the "absence of disease."[19] The physician's task is not to maintain health, but to treat disease, a distinction that has tremendous implications both for clinical medicine and for health care policy.

Second, disease is defined as the presence of certain symptoms and signs. Symptoms, such as aches, pain, or lack of energy, are what bring the patient to the physician's office; signs are objective conditions that can be measured or observed (e.g., vital signs, swelling, fever, cough), through which the physician might discover a disease, perhaps even one unknown to the patient. The objective sign takes precedence over the

subjective symptom. Alas, our world is medicalized into an alphabet soup: as we cut into our marbled steak, we worry about its impact on our LDL (low density lipoprotein). At the thirteenth tee, middle-aged men might discuss the advantages of a three-wood as well as their most recent PSA (prostate specific antigen) scores. Thus, does the sign become the focus of attention, the disease, if there is one, being invisible.

Third, there is a clear dichotomy between the mind and the body. Diseases are located in the body and caused by germ or virus or toxin or gene. Treatment involves intervening in or with body functions, or in aiding the body (as with antibiotics) to fend off disease. Even so-called mental illnesses are claimed to have an anatomical, physiological, or genetic basis; this last explanation is in current vogue because of advances in DNA analysis.

Fourth, it follows that disease states are independent from the body and thus cannot really be caused by behavioral aberrations or cultural conditions. The physician treats the malady, not the person. This is called "reductionism," meaning that complex phenomena are ultimately derived from a single principle. For medicine, what this means is that "the language of chemistry and physics will ultimately explain all biological phenomena,"[20] including states of healthfulness and disease.

Fifth, this reductionism leads to thinking of the body as a machine. Each part is evaluated and cared for by a highly trained specialist—blood and skin being parts just like the others. The relationship of one part to another (e.g., kidney to lung), or even one part to the whole, is minimized by the physician's training and the practical organization in the profession. If a part wears out, the physician mechanic repairs or replaces it. If there are problems with the whole, the physician looks for the defective part. We are reminded of a *New Yorker* cartoon, which shows the outside of a suite of physicians offices. A sign lists each doctor with an appropriate specialty, from neurosurgery to hand surgery. The last physician's specialty is shown as "side effects!"

Finally, medicine is a science. The definition, diagnosis and treatment of illness are neutral and objective, unaffected by moral or subjective judgments, or by personal cultural or financial interests. Expertise takes on the highest value, which inevitably means that the physician knows best.

The medical model accounts for, defines, and treats various and sundry human conditions as disease. Over time, more of life's experiences come under medicine's attention. Excessive drinking, treated with powerful pharmaceuticals, is a good example of a behavior that has in

recent years been defined as a disease that needs a cure. Various women's issues—birth control, abortion, weight control, breast size, and particularly menstruation and menopause—have come under the "clinical gaze," to borrow Michel Foucault's apt phrase, to be treated with pill or surgery. Birthing is medicalized from conception to delivery.

The medical model individualizes illness, not only minimizing patient input, but also ignoring the importance of the social and physical environment; the food we eat, the water we drink, the air we breathe: these are not taken seriously as causative factors in the patient's illness, or, perhaps more importantly, in the maintenance of the patient's health. The same would be true for the various stressors—unemployment, the loss of a loved one, and so forth—of one's life.

All this flashed through my mind in an instant. There is no doubt that the medical model directs the way we think about—and treat—disease. Without medicine, what would come in its place?

"It's too restrictive," Fran said. "We'd be better off with something else.

"You want to get rid of the medical model?"

She shook her head back and forth. "I want something that includes parts of the current model, but also considers other stuff."

From time to time over the next several months, we would speculate about medicine's disappearance. The snow and cold of a few Michigan winters came and passed. Fran and I, knowing what was best for us, got our vaccinations to protect us from influenza. Then, as we were hard at work on this book, there was a shortage of vaccine. Amidst much public complaint and expressions of fear, many people, we included, were not able to get our vaccinations. Public health officials worried. The winter came and went; we did not get the flu.

Then we got some insight from an article published in the *Archives of Internal Medicine*. Prior to 1980, about 15 to 20% of all elderly persons were vaccinated; by the turn of the millennium, that number had reached about 65%. It was assumed that a health benefit would be conferred on this larger proportion of the elderly. Unfortunately, it turns out that this influenza vaccine bestows no particular advantage against dying from the flu or any related cause. Indeed flu season mortality for older people declined from the late 1960s through the early 1980s. Since then it has remained constant.[21]

Thus, what we expected was not what actually happened. Were a standard medical practice such as influenza vaccines to disappear, the effect on mortality among the elderly would be negligible. The example seemed to illustrate our thesis. Perhaps we actually could assess medicine's performance with a thought experiment.

THREE GIANTS

We are like dwarfs on the shoulders of giants, purportedly said Bernard d'Chartres, the twelfth-century French philosopher. To the extent that he saw further and clearer, he said, it was not because of sharper vision, but rather that he was carried on the shoulders of giants. The phrase has become famous, used by Isaac Newton, and more recently by the eminent sociologist Robert Merton—from whom we learned it—to describe how science advances.

Three groups of giants (for, as sociologists, we always think of groups) have allowed us to imagine this book.

The first group of giants developed the idea of "thought experiments." This is a method of analysis made famous a century ago by physicists like Albert Einstein and Niels Bohr. The idea was to design an elegant experiment, and not be deterred by the fact that it could not possibly happen (trains that travel at almost the speed of light, scales that can weigh one single atom, etc.), perform the experiment entirely in one's head, with as much rigor (and as much pizzazz) as possible, and then imagine the results. In so doing, those physicists revealed some of nature's most incredible secrets.

I wanted to use this same method to get insight about the social world. Readers interested in pursuing this idea—that thought experiments *may be an innovative method* for social scientists— should consult appendix B.

Historical demographers are the second group of giants who have lent their shoulders to us.

Though I'm not old enough to be historical, I like to begin with a memory of my own.

This is what I learned on April 12, 1955: That each summer I would no longer be prevented from swimming in public pools; that innocent children no longer would suffer as did Franklin D. Roosevelt; that the March of Dimes was victorious; that no longer would the first association with the word "Jew" be Julius and Ethyl Rosenberg, who had been executed in 1952; that there was a new hero to worship.

On that day, Jonas Salk announced the successful testing of a vaccine against polio, the last of the dreaded infectious diseases to be controlled. There was a new hero. My family rejoiced. My only problem was that I was supposed to be the one to grow up and cure polio. Now my work was really cut out for me. I'd have to switch my attention and cure cancer.

I did not learn until much later that the celebration over the Salk vaccine was as much myth as science. Yes, the vaccine did work. But

what I did not know was that the death rate from polio had already declined precipitously from 1900 to 1955. Surprisingly, the new vaccine accounted for only about 6% of the decline in mortality from polio. Every life saved being the greatest achievement, this is no small feat. Tens of thousands of children would not acquire this dread disease. Yet to focus to closely on the 6% is to ignore the greater lesson from the other 94%.

The polio story was not unusual.

A careful study of historical demography teaches us two things—both quite important for this book—which seem completely counter-intuitive. First, modern medicine has had little to do with the control of deadly infectious diseases, such as typhoid, scarlet fever, and diphtheria.. According to two prominent medical sociologists: "3.5 percent probably represents a reasonable upper limit estimate of the total contribution of medical measures to the decline in mortality in the United States since 1900."[22]

Second, modern medicine has had little impact on overall life expectancy. We don't live much longer today than we did at the turn of the twentieth-century. In 1900, a seventy-year-old American, having survived the most dangerous years of youth, could expect to live another 9.3 years. By 1970, a seventy-year-old could expect an additional twelve years, an increased life expectancy of only 2.7 years. This is not an insignificant improvement, but it hardly represents a sea change in mortality, especially given the heroic medical efforts often associated with mortality at this age.[23]

Interested readers should consult appendix C for an explication of these unexpected findings.

The third giant was Ivan Illich, a prolific writer, who in 1976 published the book *Medical Nemesis*.[24] Fran and I had met him years ago when he spoke at our respective universities. He was, to say the least, an impressive character. Illich did not argue that medicine is ineffective. Rather the opposite. Not only that it is quite effective, but also—improbably it would seem at first glance—quite dangerous to society. The first two sentences in his book stated the position clearly: "The medical establishment has become a major threat to health. The disabling impact of professional control over medicine has reached the proportions of an epidemic."[25] For almost 300 pages, Illich tendered and elaborated these themes. If nothing else, *Medical Nemesis* leaves us with a valuable new word, "iatrogenesis," defined by Illich as "doctor-made illness." For Illich, the medical institution is a great and grave danger to the world, actually causing more illness and death than it prevents.

Medical Nemesis received widespread attention and praise in the popular media. The *New York Times* reviewer noted: "It is obvious that Ivan Illich is on to something here. . . . Read it and marvel at the light it sheds." Scholarly evaluation was not so positive. The John and Sonia McKinleys dismissed him as a "dilettante." Thomas McKeown wrote that Illich's book has little in common with his own, "except perhaps in the sense that the Bible and the Koran . . . are concerned with religious matters."[26] We agree with these critics, for Illich's conclusions shaped his investigation, rather than being formed by them.

Yet Illich, brilliant polemicist that he was, challenged conventional thought and opened the possibilities for critique—and for this book.

TWO SOCIOLOGISTS

Among other things, I study the certification and growth of scientific knowledge; Fran's expertise is in the sociology of medicine. Before reading further, the reader has every right to ask: how objective are the authors? What axes do we have (presumably everyone has some!) to grind? Another wonderful *New Yorker* cartoon comes to mind. "Are you a medical doctor?" asks the skeptical *maitre d'* of the hopeful diner who looks like a professor. "Or are you merely a Ph.D.?" As the latter, are we jealous of "real doctors?"

We are sociologists. By training, we are skeptics of all the professions, our own included, whose members are always (as they should be) influenced by training and vested interests, and whose ideologies are always self-serving. Note that we are not saying that the professions have a negative impact on American life. We don't believe that proposition. Rather, professionals, like everyone else, have certain positions, certain interests, that inevitably affect their behaviors and their views of what they believe to be self evident and good.

Our training leads us to debunk the professions—especially those with high prestige. The very act of writing this book indicates our willingness—our interest—to engage in critique. Yet balanced with that attitude is a real desire to understand the ways of the world for what they are—whatever they are. Our hope is that this book will lead to a better understanding of medicine, and therefore a better idea of how to improve both individual health and the institution of medicine.

Our promise to the reader is this: In an effort to be fair, we will withhold any conclusion until we have evaluated the relevant evidence to the best of our abilities. "The physician," wrote one eminent sociologist,

"is not necessarily less objective because he has made a commitment to his patient and against the germ."[27] Yet objectivity, rather than being easy or automatic, "entails some measure of *struggle* in and with the sociologist's self." We hope that this book reflects our struggle.

From both our professional training and personal experience, our attitude toward medicine is deeply ambivalent. Whenever possible, our personal practice is to avoid contact with the medical community. Ignoring expert advice, we rarely give blood or tissue for routine screening. We just don't want to medicalize our lives, at least any more than necessary. Some might call this shortsighted. Perhaps it is, but we try not to dwell on the state of our health. Yet when we do have a health scare, we eschew local service and seek out the very best care available. It is not that our suspicion and mistrust of expert medicine disappears; rather it is that fear of our own mortality asserts itself in the place of intellectual doctrine.

EVALUATION

A few decades ago, authors wrote books about famous doctors. We don't do that. Today, it is common for books about medicine to tell patients' stories, particularly ones with bad endings. We don't do that either. It is also popular these days to write about problems with our health care system, particularly about medicine's high cost, or inequalities in health care delivery—reducing individual physicians "to bits of flotsam on a great economic current," sniffed one editor of a prominent scholarly journal.[28] Our book does not address these issues, though they are of central import to sociologists. Nor do we give much attention to the significant problems of race and gender inequities in health care.

So what do we hope to accomplish?

Almost no one writes about the scientific basis of how medicine is actually practiced. What are the implications of medical practitioners paying too little attention to "W" (e.g., nutrition)? Or of routinely practicing "X" (say, annual physicals)? Or of commonly using "Y" (antibiotics are a good example)? Or of routinely using radically new surgical procedures "Z" (coronary bypass comes to mind). These practices, because they are scientific, are presumed to be off-limits to social scientists.

Yet physicians are not the only ones who can read and interpret scientific literature. Indeed, sociologists—we among them—now study the growth and development of scientific knowledge, from physics and

chemistry, as well as biology and medicine.[29] This will be our approach. We plan to examine the very practice of medicine under the microscope. What physicians actually do will therefore be of greater interest than what they think or what others think of them.

Our idea is ironic. For our critique of medicine relies on reports of medical research, written, for the most part, by physicians themselves. Of course, our goal is different from the authors of these articles.

Our method inevitably shapes our book. Our first decision is: which data do we seek, and which do we ignore, in drawing our conclusions? We cannot consider, let alone draw inferences from, stories that begin: "According to my friend . . ." or "You wouldn't believe what I heard about . . ." A few moments of watching television, even so-called news programs, demonstrate that anecdotes are commonly used to "prove" just about anything related to illness and health. We ignore all such stories. Even published scientific case studies of one person, or even a few, or even a few score, interesting though they might be, are too limited in scope to help us draw conclusions. Whenever possible, we rely on statistical data. These data give us the best picture of what is happening to most people most of the time.

As much as possible, we avoid coming to any conclusion that is based on a single study—no matter how dramatic its findings. In order for any finding to be seen as conclusive, it must be replicated, preferably more than once. This is the way that good science works. Indeed, according to a 2005 article in *JAMA*, about a third of all "highly cited" papers published in "high impact journals" cannot be replicated. In other words, their findings do not become part of standard knowledge. We should not be too disturbed by this finding, but rather, according to the paper's author, "we all need to start thinking more critically."[30]

In using published research, we understand that not all research reports have an equivalent impact on the profession. Most studies are ignored by the scientific community. A few become quite important. The more prestigious the journal, the greater the likelihood that its contents will become part of generally accepted knowledge—part, in other words, of standard practice. Journals that are official publications of scholarly or professional societies are also influential. Even more important than articles are editorials, which carry the official *imprimatur* of the journal. It is to these editorials that we turn to if and when they are available. One other type of article that deserves our special consideration is called "meta-analysis," or "meta-evaluation," a newly developed statistical technique that attempts to synthesize many different research

studies (which often show contradictory or at least varying results) into a single conclusion.

Relying on previously published work creates another problem. According to the U.S. Office of Technology Assessment, only 15 to 20% of medical procedures have ever been evaluated in rigorous scientific trials.[31] The remainder's beneficence is assumed. This is not to say that procedures in this latter category are ineffective. In the wise book, *Lives of a Cell*, Lewis Thomas—dean of medical schools at Yale and New York University and, at the time of his death, CEO of the Sloan-Kettering Institute—claimed that most medical technology is "so effective that it seems to attract the least public notice; it has come to be taken for granted."[32]

Though in this book we argue the opposite, there is surely some truth to Thomas' statement.

For example, approximately 38,000 units of blood are transfused daily. Except for issues of contamination by viruses or toxins, the effectiveness of these 26 million yearly transfusions is not studied. Rather, its goodness is assumed, probably correctly. The efficacy of transfusions is dramatically demonstrated by courts, which on occasion will order the procedure for children even over the objections of parents. A less dramatic example would involve dental care. Almost everyone brushes his or her teeth. Yet we are unaware of any scientific study that establishes the benefit of this common behavior.

There is one more problem with published research. We know that medical researchers, like those of any profession, reflect not only tradition and training, but also vested interests. Therefore most often they will conduct research on problems that they once studied as students. Therefore they are more likely to study problems that will advance their career interests, ones that will allow them to compete for and win large grants—perhaps ones that come from large pharmaceutical companies.[33] As a result, they are more likely to conduct research on chemotherapy rather than on herbal treatments for cancer. It follows inevitably that the body of published research, even with its sample biases, will defend the status quo.

PLAN OF THE BOOK

It goes without saying that medicine and the medical model, at the very heart of American culture, will not disappear. But the very act of so

imagining allows us to evaluate its role: for the good—and also for the harm—it does in contemporary society.

Our plan is straightforward. We pursue a difficult—perhaps even subversive—thought: How well does contemporary medicine work? More specifically, what is medicine's impact on mortality? We will guide the reader through a maze of scientific evidence and conclude that of all the human diseases, illnesses and maladies, rather few are treated effectively by standard medical practice. Yet the remaining problems are also treated, mostly without effect, sometimes with great danger to the patient. Thus, it turns out, counterintuitively, that clinical practice and treatment have a minimal impact on our chances of getting sick and our chances of living a long life.

If this conclusion is difficult to believe, we beg the reader's patience.

Permit us to make our case.