
Book Reviews

Fighting today's tuberculosis means we must fight AIDS, too

by Ernest Schapiro, MD

The Forgotten Plague: How the Battle against TB Was Won—and Lost

by Frank Ryan, MD

Little, Brown, Boston, 1993

480 pages, hardbound, \$20.95

Dr. Ryan tells an important story in the history of scientific discovery. His book starts with Robert Koch's 1882 presentation to a scientific audience in Germany of his discovery of the tubercle bacillus as the causative agent of tuberculosis. He pointed out that more than one-third of the deaths of people in the productive years of life were from tuberculosis.

The story could also have begun with Louis Pasteur, 35 years earlier, with his founding of the sciences of microbiology and organic chemistry.

The reliable treatment of tuberculosis required the administration of three drugs at once, as was recognized in the early 1960s. The first three drugs to qualify were streptomycin, para-aminosalicylic acid (PAS), and isoniazid. Each was developed by a team of researchers in a different country. Scientists working in Sweden, Germany, Great Britain, and the United States made the crucial breakthroughs, including the Ukrainian Selman Waksman, Denmark's Jurgen Lehmann, and France's René Dubos.

The process of discoveries

The book is particularly valuable because it beautifully describes the unique hypotheses of the scientists which led to their discoveries. For example, René Dubos became convinced that for any given microbe, he could find the means to combat it in the soil, because there was a balance within the soil among the different species of microbes dwelling there. He called this the biochemical unity of life. Dubos had been motivated to study the microbiology of the soil when he read a passage from Winogradsky who said that the place to

study microbes is in their natural habitat, not just in the lab. With the help of Selman Waksman, his superior as director of Soil Microbiology at Rutgers University, he found a microbe which could decompose cellulose. Using the same technique, while at the Rockefeller University in New York, he found a microbe in a New Jersey cranberry bog which would attack and eat the outer wall of the pneumococcus, the deadly agent of pneumonia, by means of a protein enzyme which the microbe secreted. Meanwhile, the British scientist, Alexander Fleming, noticed that where a common airborne mold, penicillium, landed and grew on his petri dish, many pathogenic bacteria were inhibited from forming colonies. He suspected that some chemical was being produced by the mold which killed the bacteria. However, the pessimistic attitude of most scientists towards looking for anti-bacterial substances caused him to delay isolating the active principle until he learned about Prontosil.

Prontosil, the first chemotherapeutic agent against bacteria, was developed by a German physician, Gerhard Domagk, on the basis of a brilliant series of observations he made on how the immune system functions. He found that if bacteria were damaged prior to inoculation into the animal host, the host's immune system was much better at digesting and killing them. This work attracted the attention of a scientist at the Bayer company, which at that time was the only company actively screening large numbers of drugs for possible anti-bacterial activity. At that time it was disbelieved that such substances could be found. Domagk's approach to drug screening was unique. He did not rely on testing antibacterial substances in the test-tube, but rather he gave them to the host along with the bacteria. It was this technique, which, in 1935, led to the discovery of the antibacterial action of Prontosil, a sulfa drug which was found to cure common hitherto fatal infections, such as streptococcal infections.

When Fleming learned about Prontosil at an international conference, he pushed ahead with the isolation of the first effective antibiotic, penicillin. Waksman was so excited by this that he, at once, assigned all of his graduate students to screen soil samples for antibiotics. One of his students, Al-

bert Schatz, isolated streptomycin, a product of a soil microbe, which became the first frontline anti-TB drug.

The Danish scientist, Jurgen Lehmann, was a brilliant physician and chemist. He was excited by the observation of his friend, the American scientist Bernheim, that when aspirin was added to a TB bacterial culture, the bacteria used much more oxygen. He proposed in 1943 that PAS, a derivative of aspirin, would block the energy production of the bacteria, simply on the basis of this observation and what he knew of the structure of the sulfa drugs. Because Lehmann's reputation was so high, he convinced Ferrosan, a small drug company in Sweden, to sink large sums of money into synthesizing PAS for the first time and mass producing what became the second front line drug for TB.

The third frontline drug, INH, was developed by Domagk on the basis of work at the Bayer company in Germany which continued throughout World War II, despite the fact that the factory and the town were both heavily bombed! The book describes the conditions under which the Bayer team worked, and the incredible courage and dedication of the scientists who were risking death from both the bombings and exposure in the laboratory to highly fatal TB microbes.

Public health measures critical

Dr. Ryan also makes clear that had TB been allowed to rage unchecked by public health measures, urban life could have ended in the industrialized countries long before we had time to discover the life-saving drugs. Tuberculosis was the leading cause of death for young adults in these countries. In 1930, for example, there were still 90,000 TB deaths per year in the United States, 60,000 in France, and 50,000 in Britain. In Britain, TB deaths accounted for nearly half of the mortality in the age range 25-35. As late as 1954, there were 5 million deaths worldwide from TB.

Thanks to Koch's discovery, physicians learned that TB was contagious and spread by coughing. In the first two decades of the 20th century, two powerful screening tools were developed, the tuberculin skin test and the chest X-ray. These were in addition to Koch and Paul Ehrlich's discovery of how to stain the sputum for detection of the bacilli.

Several years ago, the weekly newspaper *New Federalist* published a feature-length account of how public health measures reduced the TB rate in Chicago at the end of World War I. Extensive public health surveys had showed that TB was much more common in impoverished crowded households. Long working hours and poor nutrition were found to be factors as well. Despite much opposition, the health authorities put infected persons under quarantine either at home or in special TB hospitals. Everyone was tested for TB. As a result, the rate of both new cases and the fatality rate declined.

Dr. Ryan also points to the key role of the elimination of TB in cattle. Children had been acquiring fatal TB from milk. An important role in that campaign was played by a veterinarian, William Feldman, who later teamed with Dr.



In 1961, it was common sense to fight the spread of epidemic disease internationally, as shown in this photo of an employee of the Taiwan Malaria Research Institute inspecting a farmer's house. As a result of such efforts, malaria was officially eradicated in Taiwan. But neglect of such public health measures over the past 20 years has allowed old scourges, like TB, to revive and combine with new plagues such as AIDS.

Corwin Hinshaw, a physician at the Mayo Clinic, to screen and clinically test streptomycin in patients.

In comparing the period when rigorous public health measures were applied to controlling the spread of TB to today, we need to bear in mind that, *at that time, governments were still committed to the idea of keeping the population healthy, and therefore all available public health tools were put to use.*

Once the first three frontline TB drugs had been developed, mankind was for a time in the position to totally eliminate the disease. TB rates rapidly declined in the industrialized countries. It was also found that individuals in the developing nations could be cured with six months of uninterrupted treatment with two suitable anti-TB drugs, given on an out-patient basis. In addition, the risk of future TB in an otherwise healthy carrier could be greatly reduced by six months of INH. TB rates continued to decline, on into the late 1970s.

Worldwide biological breakdown

However, in 1974, the *EIR* Biological Holocaust Task Force, initiated by Lyndon H. LaRouche, Jr. and directed by Warren Hamerman, wrote a prophetic and detailed report

which described the impending worldwide breakdown of human health in which advances achieved by cleaner water supplies, insecticides, immunization, improved nutrition, improved veterinary care, and chemotherapy for infections such as TB would be lost. New types of diseases would occur, especially viral, and old plagues would return, such as cholera. The team forecast that these setbacks would become apparent in the early 1980s, and would grow until they became unstoppable, unless the economic austerity policies of the International Monetary Fund ("conditionalities"), were stopped and replaced with policies allowing economic growth. Instead, they were intensified.

In 1985, *EIR* began to publish the results of the task force's lengthy studies: "Economic Breakdown and the Threat of Global Pandemics," "An Emergency War Plan to Fight AIDS and Other Pandemics," and numerous articles. The "Emergency War Plan" included an interview with Drs. Mark Whiteside and Carolyn McCleod, describing the coincidence of AIDS and TB in the impoverished migrant farm worker community of Belle Glade, Florida. That same year, a member of the task force, Dr. Debra Hanania-Freeman, investigated the outbreak of highly fatal TB among oyster shuckers, poor migrant workers in the Eastern Shore of Maryland. The Maryland Department of Health denied that the outbreak had anything to do with AIDS, but then shut down the work facilities and tore down the shacks where the victims lived. The task force suspected we were dealing with drug resistant TB.

In New York City, also in 1985, the Health Department published a detailed report proving the connection between the resurgence of TB there to the epidemic of AIDS. However, the report did not receive national attention. The federal Centers for Disease Control in Atlanta, Georgia continued to play down the potential for unlimited spread of this new plague, and, instead, opposed universal AIDS testing despite the now-proven fact that AIDS carriers were now likely to be TB carriers.

This author worked in the early 1980s at a New York City clinic where future welfare recipients were screened for diseases—except that there was no testing for TB, because of the budget austerity in the city. New York's budget had been placed under the control of the Emergency Financial Control Board whose priority was repaying the city's debt. At that time the clinic director conducted a pilot project testing alcoholics and drug addicts for TB: We found many, many cases.

In 1985, Lyndon H. LaRouche, Jr. announced his presidential campaign for the election of 1988. He said, he felt the obligation to highlight the health catastrophe for the world's population posed by AIDS. In 1986 and again in 1988, the LaRouche movement put initiatives on the California ballot to have AIDS declared a reportable disease. The initiative was defeated by the medical establishment and the Hollywood mafia.

New scourge: drug-resistant disease

In the last chapter of his book, Dr. Ryan points to the resurgence of TB in New York City, which is shown by the rise in total cases: In 1978, 1,307 cases; in 1989, 2,500 cases; in 1991, 4,000 cases. This increase is occurring in the urban centers of Europe as well. Ryan cites the well-known fact that when one carries both the AIDS virus and the tubercle bacillus, that the previously dormant TB is likely to be activated. TB in an AIDS carrier is likely to be far more rapid in its course. Moreover, the TB is likely to cause the AIDS carrier state to shift into active disease as well. TB in an AIDS victim is treatable in principle, but the mortality in such cases is far higher and the course is much faster.

Together with the resurgence of TB throughout the world, especially in areas where AIDS is present, we now have multi-drug resistant TB. MDR-TB has the same mortality rate as TB did before drug therapy, i.e. at least 50%. A large percentage of the new cases in New York City are resistant to the TB drugs. MDR-TB is being seen in other urban centers in the U.S. As Dr. Ryan points out, the development of drug resistance has long been the clinician's nightmare. If one drug is used alone, the microbes will develop resistance to it over a period of, at most, a few months. That was why, in the early years after TB was identified, before multi-drug therapy was available, the types of TB which could be cured were those which were of acute onset, and even then many failures occurred. For example, chronic cavitating tuberculosis of the lungs could not be cured by one drug alone. Often such cases require three drugs. At best, a single drug would reduce the total amount of infection to the point where surgeons could remove the remaining diseased portion and thereby hopefully achieve an actual cure.

Ryan describes how clinicians finally discovered that the resistance problem could be circumvented by administering two, or, far better, three drugs at once for at least six months. However, if the patient discontinued one or more of the drugs or interrupted the treatment, then resistance was a likely outcome. This disaster has been attributed by bacteriologists to genetic mutation to a resistant strain. Combining drugs tends to mean that any strain which is a mutant resistant to one of the drugs will still be eliminated by the other drug(s). However it is possible that there are other factors involved in causing drug resistance.

Given the AIDS pandemic and the breakdown of both adequate housing and the health care delivery system in urban centers, it is easy to see how this tragedy could occur: An occasional problem in the 1970s and '80s, MDR-TB has become a scourge in the early 1990s. The implications are staggering. Health care personnel are now at risk for a fatal disease, all the more so, because, since the sanatoria have been shut down, TB is being treated in general hospitals, which are not designed to control air-borne infections. Also we can no longer treat infected but still healthy carriers with isoniazid to eradicate the carrier state, because the microbe

will be resistant to the isoniazid.

Is there hope? Will we in several years have a rampant TB epidemic in the United States comparable to conditions before drug therapy? Given AIDS and the degree of economic breakdown, might it not, in fact, be worse?

Dr. Ryan expresses the belief that if governments take the problem seriously, they can bring TB under control. He proposes several measures: 1) Make sure that all persons given TB drugs are supervised through out their treatment to ensure that they take all of the required drugs and for the required length of time. 2) Develop new anti-TB drugs. 3) Industrialized nations should provide extensive medical assistance to developing nations to help them provide adequate treatment.

However, his approach, which he calls a compassionate one, will necessarily fail, because it views TB as being basically the same disease as it was 20 years ago. In fact, TB is now just one part of a much larger problem, the biological holocaust, which has been unleashed through out the world by the insane looting policies of international financial institutions.

At this point, we will never be able to stop TB, unless we can control AIDS. This alone requires a large-scale program which includes three basic points: 1) A crash program in biological research for AIDS control including clinical trials. Trials should include the use of oral interferon. We will need a lot of fundamental biological research which should include routes of transmission. 2) Public health measures applied to AIDS and tuberculosis to identify infected persons and routes of transmission. AIDS must be declared a reportable infection. 3) We need to construct special hospitals for the care of persons with AIDS and tuberculosis.

But these measures, costly as they may seem, are only a small part of what is required. In many parts of the world, the biological holocaust is a complex pattern of ill health which includes such major contributing factors as malaria. To address the problem will require adequate housing, building transportation and water infrastructure, control of the insect vectors of disease, providing clean water free of bacteria and other disease vectors, such as the snails that spread schistosomiasis. We will need productive agriculture for people to have health-giving nutrition.

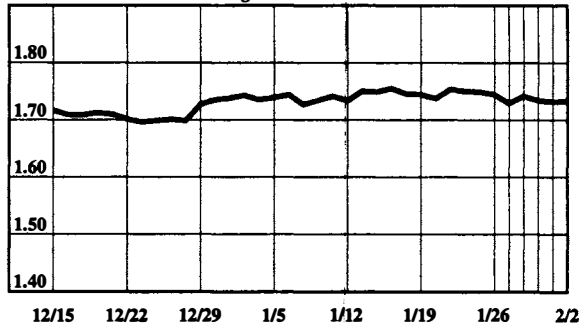
Therefore, we have to honestly address what it is that will be required to cause a global economic recovery. When EIR's task force first formulated the problem, we said that as long as there was a weak link, that is, a part of the world where a devastated population was breeding new diseases, that weak link would be a source of uncontrollable disease for other parts of the world. We still assert, on the basis of the situation 20 years after our initial report, that this is the only way to address human health. The standard of living of the entire human population must be brought up to an adequate level to ensure the health of all.

Morality and the science of public health coincide.

Currency Rates

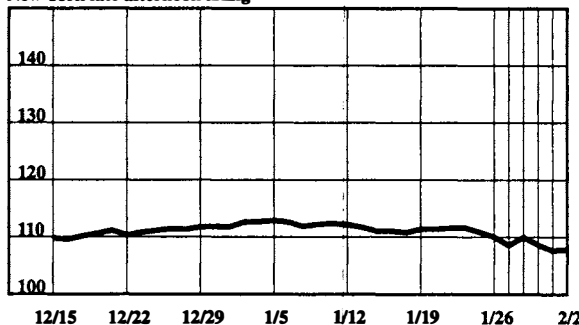
The dollar in deutschemarks

New York late afternoon fixing



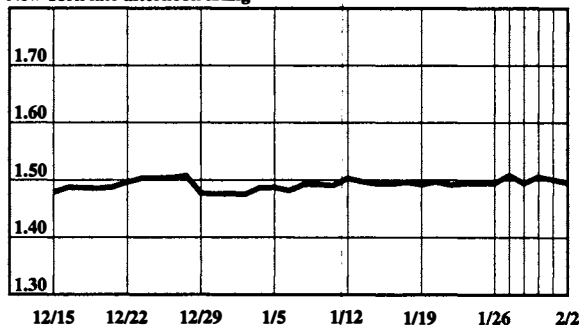
The dollar in yen

New York late afternoon fixing



The British pound in dollars

New York late afternoon fixing



The dollar in Swiss francs

New York late afternoon fixing

