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E. Charlton Prather (CP): This afternoon we're privileged to have Ms. Minnie Schreiber as our guest. Ms. Schreiber is the longtime chief bacteriologist for the Florida State Board of Health Laboratory Systems, officed in Jacksonville. Minnie, it's truly a privilege to have you come and share with us your fruitful and just delightful story and history as a laboratorian with the Florida State Board of Health[1] and its successor systems. We are just pleased to have you here.

Minnie Schreiber (MS): Thank you.

CP: What really got you interested in bacteriology[2]? You seem like an unlikely person as a bacteriologist.

MS: Well, when I started out, 1936, women were not as prominent scientists as they are today. In fact, many of the schools that I applied to wouldn't let me come. And I went to the University of Georgia because we could not afford for me to go to anything but a Georgia school. And they had a bacteriology department—was just beginning; wasn't doing very well—and I, in my sophomore year, decided I wanted to go further.

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1 The Florida State Board of Health was the forerunner to the Florida Department of Health and Rehabilitative Services (HRS). The Florida legislature dissolved it in 1970, following the passing 1969 Reorganization Act, which consolidated 200 state agencies and boards into 23 departments.

2 Bacteriology is the subdivision of microbiology involving the identification, classification, and characterization of bacterial species.

I couldn't afford to go to medical school. I tried to go to Emory [University], but Emory didn't take women. And I couldn't get into Minnesota; they didn't want me. So I went to the University of Kentucky, and Dr. Maura Sherego (sic) had a magnificent Department of Bacteriology, and I was hooked after that.

And I got to know some splendid, splendid prominent scientists who came from that school. One of them was Dr. Phil Edwards—that big man in salmonella[3]. And I had a varied career.

I worked after I got my bachelor's and my master's from Kentucky. I worked for Emory; I worked for the veterans in Washington; I worked for Johns Hopkins [University]. But then, I had to come home and look after my father in Waycross, Georgia[4], until he died. And then I decided it was time for me to stay near home, and I came to Jacksonville, Florida, to work for the state of Florida—the Bureau of Laboratories[5]—in 1951.

CP: How did you learn about openings here? Did you apply, or you just came on a hunch?

MS: I didn't know. I was, after all, only 75 miles, and I was just hunting a job. And I called them, and they said, Yes, they had an opening. And I came right away to get a job, and they sent me to Tampa to work for that wonderful man, Mr. Homer Venters.

And it was a wonderful experience, but they didn't let me stay long because in December 1951, I came to Jacksonville and worked there for almost 38 years. And when I came in 1951, the Bureau of Laboratories—this was the central laboratory, and it was located in Jacksonville. And it was located in Jacksonville, rather than the capital, because it was so accessible by rail, by water, and air. And it was right here that most of the specimens were delivered.

This was a golden age in public health. It was a wonderful time for the state of Florida, as far as public health. They had gathered together some of the most knowledgeable and

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3 Salmonella is a common bacterial disease that affects the intestinal tract caused by the *Salmonella* bacteria. Humans contract salmonella through contaminated water or food.

4 Otitis media is a type of ear infection that occurs in the middle ear and is most often responsible for earaches children and adults. Aviators are particularly susceptible to otitis media due to the difference in air pressure between the atmosphere and the middle ear when flying.

5 In 1975, the Florida legislature passed the HRS [Health Rehabilitative Services] Reorganization Act to both decentralize and unify health, rehabilitation, and social services in the state. As a result, all state public health bureaus, sections, and units were restructured and redistributed to be governed by one of 11 HRS offices or three central administrative units in Tallahassee.

experienced scientists, and they believed in the importance of public health, and they came to work in Florida.

That time, Dr. Albert Victor Hardy[6] was the director of the Bureau of Laboratories. He was a very intelligent and very innovative man, and he attracted many national and international scientists. And they were dedicated and diligently worked for the good of public health.

Now, one of the people that he attracted was Dr. Roland Mitchell. And Dr. Roland Mitchell was the director of microbiology at the international laboratory in Houston, Texas. And he was interested in determining the role—the diagnostic role—of otitis media, which caused great difficulty in aviators.

And he had set up, with Dr. Hardy, a series of grants, so that the laboratories could work on determining the role—the etiological role—of the bacteriological etiology[7] of this disease and determine what clinical procedures would be needed to help cure the aviators rapidly. So in the central laboratory and in the Tampa laboratory, with the Jacksonville Naval Air Station,[8] and MacDill Air [Force] Base[9] in Tampa, they did these tests to determine the role of *Pseudomonas*[10], a bacteria in this disease.

And they did antibiotic sensitivity tests[11] to see if they could chart the procedures of what was necessary to alleviate the disease in the aviators. And we were able to write papers in 1951, ’52, ’53, ’54, detailing the role of the *Pseudomonas* organism and doing antibiotic sensitivity tests to evaluate the therapeutic response. This was a very important study and gave exposure to many of us in the papers that were published.

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6 Dr. Albert V. Hardy, MD, MPH, served as health officer of the state of Florida and president of the Florida Public Health Association in 1962.

7 Etiology, in medicine, refers to the causes or manner of causation of a disease or condition.

8 Naval Air Station Jacksonville (NAS Jacksonville) is a military airport located four miles south of the central business district of Jacksonville, Florida, United States. With over 23,000 employed personnel, NAS Jacksonville is considered to be one of the leading centers of naval activity in the United States South.

9 MacDill Air Force Base is an active United States Air Force base located approximately 4 miles southwest of downtown Tampa, Florida.

10 The *Pseudomonas* bacterium is a genus of rod-shaped, aerobic bacteria commonly found in soil, plants, animals and water. This genus of bacteria is responsible for Pseudomonas infections, the most common of which is *Pseudomonas aeruginosa*. Symptoms of this infection include urinary tract infections, ear infections, eye infections, and severe pneumonia.

11 Antibiotic sensitivity testing, also known as susceptibility testing, is used in medicine to determine which antibiotics at which dosage will inhibit the growth of the bacteria or fungi causing a specific infection.

Now, you know, public health is concerned about the spread of infectious disease, and, most especially, the virulent ones, such as typhoid fever[12]. In 1973, if you were referred to the annual report, Florida had the dubious distinction of having one disease outbreak that attracted national attention. Remember, this was a typhoid outbreak in a migrant labor camp in south Dade County[13].

It was scary. It was scary. There were over 200 persons who contracted the disease, but prompt action by the Dade County Health Department,[14] by the Miami laboratory, by the Department of Public Health, the federal health authorities, we were able to prevent the spread of this virulent disease to people outside the camp.

It was vital that stool cultures be cultured, and those persons carrying the disease needed to be identified. We did almost 5,000 stool cultures in a very few weeks, and the way they would get the specimens—now, that's a lot of specimens. And the Tampa regional laboratory helped in this way by sending materials to the Miami lab to be used for this. The Dade County Highway Patrol met the Duval County Highway Patrol halfway, and they brought the specimens from Dade County to the Duval County Highway people. And they delivered them to the laboratory in Jacksonville.

The investigation showed that a potable water supply was the only common source of infection and the only thing it could possibly be. It probably was from the well water or other waters that were available to the migrants. The epidemiological laboratory, research laboratory, had a special high-volume, filter apparatus for sampling the suspect environmental and well waters at the campsite.

It was gratifying to notice the enthusiastic response of everyone. Everyone wanted to find out where it was and why it was. And they were able to prove that the water was the source, and 198 specimens, strains of typhoid, were isolated.

Such teamwork and such enthusiasm, such diligence, such dedication saved the state of Florida from an outbreak of typhoid fever, which was a mean disease. And all this, all this is in the *Florida State Board of Health Annual Report*[15] for that year, and it makes for

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12 Typhoid fever, also known as enteric fever, is a bacterial disease, caused by the bacteria *Salmonella typhi*. It is transmitted through the ingestion of food or drink contaminated by the feces or urine of infected organisms. Symptoms include high fever, headaches, and diarrhea.

13 In 1973, a migrant labor camp in South Dade County, Florida, saw an outbreak of typhoid fever, with 210 recorded instances of the fever among a group of only 1,400 residents. The outbreak was caused by the distribution of infected, untreated water among the camp's residents by the camp's well water system.

14 In 1970, following the dissolution of the Florida State Board of Health and subsequent creation of HRS, county health departments were transferred to HRS under the Division of Health.

15 Prior to its dissolution, the Florida State Board of Health published detailed accounts of each year's economical expenditures, research focuses and findings, policy recommendations, etc. in a series of

good reading to know the importance of public health. Most vital at that time, and always, is what we know as turnaround time[16]. The faster we can get the answer out, the faster we can stop the spread of the disease.

And that was why it was important that we lived and worked in an environment that was favored—learning new things, doing new things, investigating new things. And so it was our privilege to be able to work in the laboratory and do scientific research on procedures and diagnosis of diseases, so that we could cut down the turnaround time. And one of those things that we worked on, that is still being used in the laboratory today and in many other laboratories, was a media, a culture food for the bacteria, that is known as Urea Triple Sugar Iron Agar[17].

By working out a way to combine these two media, we were able to save 48 hours—that's two days—in turnaround time. This was recorded. We were allowed to go at the national meeting of American Society for Microbiology[18] in 1970.

We have the distinction of being a maritime state—we have water around. But, not only is it for pleasure, for economic reasons, it also is vital for the state to be able to keep this maritime presence free of disease. Now, there is a disease known as *Vibrio cholerae* [cholera],[19] which is a bad—and been in the world for many, many years.

The kin to this *Vibrio cholerae* are other *Vibrio*[20] that live in the waters and in the fish around the state of Florida, and they're still here. And many of them cause fish kills—many of them are eaten by people, and some of them get enteric disease, but some of them die. And in 1984, with the Department of Epidemiology in Tallahassee, we were able to do some work on these *Vibrio*. And this was published, showing the importance of this important group of bacteria and how to control them.

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volumes entitled *The Florida State Board of Health Annual Reports*.

16 Turnaround time, also referred to as turnover time, in medicine, refers to the time interval between the ordering of a laboratory test and the reporting of results.

17 Triple Sugar Iron (TSI) Agar is a dehydrated chemical medium utilized in laboratory testing to differentiate different types of bacteria; it is often prepared with Urea Agar or Urea Broth to produce a liquid substance. The bacterium is determined based on the type of fermentation the culture produces after being exposed to the medium.

18 The American Society for Microbiology, originally the Society of American Bacteriologists, is a professional organization for scientists who study viruses, bacteria, fungi, algae, and protozoa as well as other aspects of microbiology.

19 *Vibrio cholerae* is a comma-shaped anaerobic bacterium that can be transmitted among organisms by the ingestion of *V. cholerae* contaminated food and water. Certain strains of *V. cholerae* are responsible for the potentially fatal disease cholera, an infection of the small intestine that causes severe diarrhea and dehydration in humans.

20 *Vibrio* is a genus of comma-shaped bacteria, several species of which can cause foodborne illness (such as cholera) in humans, usually through the consumption of undercooked seafood.

And, as a result of this work, the epidemiologist went to Washington, and some of the present-day regulations for seafood were put into effect due to some of the studies that he did with the Bureau of Laboratories. Oh, a long time ago, I guess it was before I came to Florida, and it has continued, Florida was a haven for many people who wanted to come down to the state, bring a shingle, and announce to the world that they were a laboratory.

And then, they were taking disease specimens, and they would give them what's better known as the sink test—you know, throw it in the sink and give an answer. Well, this was very dangerous, and it was a dangerous practice. And the people who, in qualified laboratories, who did correct testing—these people were known as medical technologists. And in 1949, 50 years ago, the state licensure for medical technologists was passed[21].

Examinations for these people coming down, who wanted to have laboratories, were placed in the hands of the board of examiners. Dr. Mark Emmel was the director of the basic science board, and it was he who was in charge. But, very wisely, he set up a sub-board for medical technologists and gave it to the Office of Laboratory Services—or, as it was called then, the Bureau of Laboratories.

And the person he made in charge was a very lovable, wonderful lady, Ms. Carolyn Roth[22]. She was the senior serologist[23] for the Office of Laboratory Services, but she was well liked and loved by all the medical technologists and laboratorians in the state of Florida. And she could talk to them, she could coerce them, she could persuade them to do the right thing, and she was a marvelous human being that we owe a lot to.

At the time she worked for the state of Florida, she was also the executive secretary for the Florida Society of Medical Technology. And she set about to improve the competency of medical laboratory scientists. She set about to improve the laboratory science of the state of Florida and did much for the state in improving the good health for the people of Florida.

She organized conventions. She used some of the license dollar to bring down scientists who were informed, who were willing to teach these medical laboratory technicians better procedures, what to do. She used some of the license dollar to print a newspaper,

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21 As per Florida Statute 483.11, established 1949, anyone wishing to practice as a medical technologist director in the state of Florida must first receive licensure from the State Board of Health. Prerequisites for licensure are also established in the statute and include previous professional experience as well as a university degree in a science field.

22 Dr. Carolyn Roth, MPH, served as president of the Florida Public Health Association in 1963 and assistant director of laboratories for the Florida State Board of Health.

23 Serology is the scientific study of body fluids. Serologists, in the medical field, are concerned with the diagnostic identification of antibodies body fluids such as serum.

and I was the editor. This newspaper was started—I forget when it was started—but it ended in 1970. And all of the papers are on file at the Borland Library,[24] and I have them in my file.

But the purpose of this was education. It was a quarterly, and it went to every medical laboratory technologist in the state of Florida, no matter whether they were licensed or not licensed. It was an education device.

As Florida grew, as the practice of medicine changed, it was important that this medical technology law be improved. And in 1967, the new licensure law was passed, and this law gave the Bureau of Laboratories the role of inspecting: checking on these laboratories, going into there, checking on their competence, making sure that everyone was licensed, making sure they were using quality control procedures.

And it was the lifesaver for the state of Florida. It kept out people who were not competent. There was the beginning—Florida from California, other states put in this law: New York, Delaware, New Jersey. They knew that they had to ensure that the laboratory answers were correct.

Now, we take it for granted that laboratory tests are correct, but you don't realize they all rest on the shoulders of the people who pioneered this at the Bureau of Laboratories for the state of Florida. And now, it is not up to the laboratory, but there is a new group, known as the Office of Licensure. And this procedure is still going into the laboratories—they're federal laboratory inspectors—and it guarantees that only licensure people, who have had examination, who've earned continuing education credits, are working for the people of the state of Florida.

Later years in the Office of Laboratory Service, it was important that we look into other, more esoteric diseases, and one of these was whooping cough[25]. Now, whooping cough is caused by an organism—when I left, was called *Bordetella pertussis*[26]. And to grow this organism took a full 10 days, and then it was difficult.

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24 The Borland Health Sciences Library, located in Jacksonville, Florida, is a branch of the University of Florida Health Science Center Libraries that houses various collections of medical journals, reports, dissertations, and other resources for health research.

25 Whooping cough is a highly contagious respiratory tract infection that is particularly prevalent in infants. Its symptoms include a chronic cough that sounds like a "whoop," fever, severe congestion, and episodes of no breathing. In the early 20th century, whooping cough was a major cause of infant and child mortality in the United States.

26 *Bordetella pertussis* is an aerobic bacterium that invades the tissue of respiratory cells and causes severe inflammation of the respiratory tract. It is the causal bacterial agent of whooping cough.

So, we had to find a way to get an answer for this disease. It was important for the welfare of the children. Even though there was a vaccine, a lot of the parents didn't want the vaccine; it had adverse effects. And this disease could cause deafness, could cause death.

So we engineered—or, we worked on a procedure where we could take the throat cultures from these children and mix them with antibodies to this *Bordetella* and put them on a slide, and they would brighten up—or fluoresce—under a special microscope. That's called fluorescent microscopy[27]. And we could get an answer in two or three hours, and then we could call the physician or the county health department and give them the answer. This procedure is now used, not only for this disease, but many other diseases, cutting the turnaround time from days to hours.

In other diseases that were very important, like the beta-hemolytic streptococci[28], rheumatic fever[29] or *S. typhosa*[30] or *Shigella*[31], an enteric disease. There were new organisms that were surfacing that we had to study. Usually, they were only happening in hospitals, but the hospitals did not have the facilities for identifying these organisms.

These were organisms that were known as anaerobes—that meant they couldn't grow in air; they were aerobic. Now, we knew about those organisms in food poisoning: There was botulism[32]—*Clostridium botulinum*[33] that caused botulism in food. There was *Clostridium welchii*[34] that caused food poisoning in food. There was *Clostridium*

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27 Fluorescent microscopy is a technique used for studying and examining specimens. Fluorescence microscopes use phosphorescence and fluorescence to illuminate certain features of microorganisms or inorganic substances.

28 Beta-hemolytic streptococci, more commonly known as strep throat, is an infection of the mucous membranes lining the pharynx often accompanied by a swelling of the tonsils. Untreated strep throat can develop into rheumatic fever.

29 Rheumatic fever is an illness that arises as a complication of untreated or inadequately treated strep throat infection. It is most common in children and young adults. In severe cases, rheumatic fever can cause heart failure.

30 *S. typhosa*, or *Salmonella typhosa*, is a strain of the *Salmonella* bacteria that causes typhoid fever, a potentially fatal enteric disease spread primarily through contaminated food and water.

31 Shigella is a diarrheal intestinal disease caused by a group of bacteria also called *Shigella*, which is closely related to the *Salmonella* bacteria.

32 Botulism is a type of food poisoning caused by the bacterium *Clostridium botulinum* growing on improperly sterilized canned meats and other preserved foods. Botulism is rare but serious, as it causes paralysis and can be fatal.

33 *Clostridium botulinum* is a type of aerobic bacteria that often grows on improperly sterilized foods. It is powerful and deadly, even in small quantities.

34 *Clostridium welchii* is a bacterial species that is the chief causative agent of gas gangrene in humans and other animals, especially sheep. It is the most common source of food poisoning in the United States, and it can be found in milk, soil, water, dust, and the intestinal tract of humans.

perfringens[35]. It caused gas gangrene[36] in wounds. Now, we had another group, that were causing brain abscesses, and this was the *bacteroides fragilis*[37]group.

Now, we had, in our laboratory, a scientist—B. Malone—and she was very interested in these bacteria, and she reported on them at the American Public Health Association[38] in San Francisco. And she told of our work in helping these hospitals and summarized the research and diagnostic procedures in this very important group of organisms that much is still not known about today. But we pioneered in this work—in our laboratory—and did many esoteric procedures to help the hospitals find the answers for these organisms.

There was another group of organisms that we worked with, and they were *Neisseria gonorrhoeae*[39]. Any time you have centers, we always manage to get a fair amount of money for laboratory procedures. And Ms. Roth was very instrumental in helping us get money for some of this work.

And one year, we were able to give a paper on this organism, and the doctor was Dr. Jose Astravé. Dr. Jose Astravé was a pathologist in Cuba, and when Castro came into power, he had to flee. And so he came to work for us.

And he worked on a procedure because most of our specimens where mailed in, where we could improve the diagnosis of *Neisseria ghonorrhoeae* in our laboratory by a special transport media—Transgrow media[40]. And he reported on this at the Southeastern Society of American Microbiology[41] in Augusta, Georgia. Imagine—fleeing a country and now being able to report a scientific procedure in another country.

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35 Also known as gas bacillus, *Clostridium perfringens* is an anaerobic bacterium that causes gas gangrene in the infected tissue of humans.

36 Gas gangrene is a form of rapidly spreading gangrene occurring in dirty wounds infected by bacteria (usually *Clostridium perfringens*) that give off a foul-smelling gas. Gas gangrene is considered a medical emergency and can be fatal.

37 *Bacteriodes fragilis* is an anaerobic bacterium that is naturally occurring in the human colon, but can cause infection if displaced to surrounding tissue or the bloodstream.

38 The American Public Health Association (APHA) is a professional organization for public health professionals in the United States and is composed of over 25,000 members. It is the only health organization that influences federal policy.

39 *Neisseria gonorrhoeae*, also known as *gonococci*, is a species of bacteria responsible for the sexually transmitted infection, gonorrhea.

40 Transgrow medium is a substance used for the transport and cultivation of certain bacteria, such as *Neisseria gonorrhoeae*. This medium is essential to the study of certain microorganisms.

41 The Southeastern Society of American Microbiology is an organization that promotes scientific knowledge of microbiology in the Southeastern United States by providing educational opportunities, such as conferences and scholarships, to its members.

This was a very valuable thing for us, and we used this media to help facilitate the diagnosis of gonorrhea. It was important that you work with people like Ms. Roth and Dr. Hardy, who encourage you to improve our procedures and our methods. It was stimulating and challenging. It was important.

Education and professional activities were encouraged. And we were able to go and work and be with other professionals—learn new and innovative procedures. It was a warm and pleasant group of caring people who became a family to me.

CP: That's a fascinating story, Ms. Schreiber.

MS: Well, it was a fascinating time for me. And I still marvel that we were able, at that time, to do so much and to improve laboratory procedures. Today, we live in a different world.

It's a genetic basis for a lot of work done in bacteriology and medicine. And they are presently working on such tests in this laboratory, and some day, the turnaround time will be reduced—much more than we were able to do. But it takes an environment of caring, an environment of education, and it takes a group of people who care—who want to improve the good health of those around them.

CP: You mentioned that Dr. Hardy had this nurturing attitude—that he wanted you to be innovative; he wanted you to do the research. It was your leadership, generally, or has it always been, the leadership at the laboratory, was anxious for its—for the lack of a better term—technicians to get into the unknown areas?

MS: No, but after Dr. Hardy came one of his prodigies, Dr. Nathan Schneider[42], and he also wanted to project this. He wanted to keep cultivating research, education. And after him, came Dr. Hardwick and they too.

Now, what happens at the top depends on the state health officer. And as time went on, we had many, such as you, Dr. Prather, who cared, who wanted this to be, but it did not necessarily filter down. And I don't know that it's still there today.

42Dr. Nathan J. Schneider, PhD, served as the president of the Florida Public Health Association (FPHA) in 1960. He received the FPHA meritorious award in 1971.

I haven't kept up with a lot of the laboratory procedures. I've been retired for 10 years, but I have been working in a genetic laboratory for Alzheimer's. And I am impressed with the genetics, with the role of the computer and what they're doing.

But also, they still need a supply section—just as important as it was in our public health laboratory. I help them prepare their tips, their pipette tips, which they need. I prepare their solutions—autoclave them, which they need. Yes, they still have to have the supplies that we had to have, which we taught laboratories how to organize. We taught them how to get a lot of work done.

A public health laboratory gets thousands of specimens, and this means that you must do your work in a prescribed manner. You must have good reagents; you must have your materials ready, and you will get your answer fast. Not only is it good for a good answer, but it's also good for accumulation of data. You have thousands of specimens, which give you answers that you can rely on.

A scientific work based on a few specimens is of no value, and a public health laboratory, which receives large numbers of specimens, can give out answers and help facilitate future study. You take AIDS[43]. You able—the present-day laboratories—the study of the AIDS has been very instrumental in opening up new avenues for science. They have large enough samples so that they can make scientific evaluation. This is very important, and you can use this and get answers that are reliable.

But this isn't the only area of work today. We have many diseases that we have not found answers for, and they go very fast. The Ebola[44] virus—where it came from, what it can do—it's something that we need. There's no machine that's going to work it out for us.

We need good minds. Yes, we have tools. And yes, we can do some procedures with a strip. But we have many other important diseases that need study. There have been a lot of things that we've thought of, that we thought were body conditions that brought about. And yet, we've gone back and found that it was an etiological agent, bacteria, or a virus that was causing it.

People have had ulcers for years, and they've had all sorts of treatment. And yes, they'd get well for a while; and then, they wouldn't. Now, come to find out, we have

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43 AIDS, acquired immunodeficiency syndrome is caused by human immunodeficiency virus (HIV), which attacks the body's T-cells and interferes with the body's ability to fight infections.

44 Ebola hemorrhagic fever is a virus that causes severe bleeding, organ failure, and can lead to death. It is spread through direct contact with blood and body fluids of an infected person.

Campylobacter[45]. It has another name, but I don't know that I would pronounce it correctly.

But this organism they learned about by studying stool specimens from people who got enteric disease. And, from these studies, they learned how to culture this organism. Yes, now, you can do a simple urea test, and now you can tell that this organism is present, but it's on the shoulders of people who have done dedicated and diligent laboratory work.

So there is a marvelous field for young people or some older people to go into. It's not going to be by a computer—it takes the brainpower to figure it out, to put the facts together, and to determine which disease and what causes it. I have worked with these people, and I have seen how they have come up with the genetic code that they attribute to Parkinson's, and they're still looking for the genetic codes that go with Alzheimer's.

Who knows? Maybe there are genetic codes that have some importance in pathogenic diseases. Maybe there are certain disease processes—there are some already, I know, for cystic fibrosis.

For a while, for cystic fibrosis, it was the diagnosis of the disease by the large numbers of the *Pseudomonas* organism, the same one that caused the otitis media. Now, they've been able to go back and find the genetic code that goes with the disease, and maybe they will with gene therapy—I don't know quite how that's done—they may be able to cure this disease.

CP: Wow.

MS: We still need the bacteriologists. We still have the people with the disease. The numbers of the *Pseudomonas* indicate the stage of the disease. We still need people to do these kinds of tests. We still need people to go from there to molecular studies to see which ones are involved, to see what codes are in these people who have the disease.

I can only say, it would be a challenging and wonderful career for someone to go into it today. It's not cut and dried. And it's not all in the computer.

45*Campylobacter* is a bacterium that sometimes causes abortion in animals and is one of the most common causes of food poisoning in humans. It is usually transmitted through infected food or water, infecting the gastrointestinal tract and causing diarrhea, fever, and cramps.

CP: We thought, at one time, that Pasteur[46] himself had done all the answers to man's disease processes, but that was soon proven incorrect. And hearing you talk earlier this afternoon, I would reason that we've found all the bacteria answers, but now you're disavowing that. There's still a place for a table bacteriologist.

MS: There is. It may be that you will not use the same tools that we use, maybe. I don't know. But, somehow, the same procedures, the same regimen, the same, should I say, the same directions—you have to learn how to organize, you have to learn how to determine what needs to be answered, how to get there, what tools you need, what procedures would be of use.

You won't get it the first time. There is not a dictionary out there to tell you what to do, and this is a way for your ingenuity, for your skills to be developed. And it's such a satisfying thing to be able to figure out a problem—to get an answer. And it's so satisfying when you can get a person well if you know the answer and you know the cure.

CP: Yes.

MS: Isn't that so?

CP: Yes, it is. But what's the most impressive innovation in bacteriology that you witnessed here, in your more than 38 years?

MS: Well, I really think the thing that meant a great deal to me was this gas chromatograph[47]. This gas chromatograph is a machine that—while the bacteria are growing, they produce certain products, and these products are like fingerprints of the organism. And it was this procedure that was worked out at the Virginia Polytechnic Institute for the anaerobic bacteria.

And we had one of these gas chromatographs at our laboratory. And we could put a name on the bacteria by what it did while it was breathing. That was very, very remarkable.

CP: That's fascinating.

46Louis Pasteur was a French chemist and microbiologist renowned for his discoveries of the principles of vaccination, microbial fermentation and pasteurization.

47A gas chromatograph (GC) is an analytical instrument that measures the content of various components in a sample. It is used for separating and analyzing compounds.

MS: Yes, it was. But you had to talk real sweet to the machine because it would act up if you were ugly to it, so I was very careful to be good and talk nice to my gas chromatograph. But that was—the opening up of these organisms, the revealing of these organisms—probably one of the finest things that was done in this era because these are bacteria we didn't know about. We couldn't determine what they were, and all we had was a big mess.

I'm afraid the thing that I feel the worst about is the role of antibiotics in the control of infection. We have come full circle, and now we're about to lose these important bacteria killers. It's a sad thing. It is a sad thing when a child comes in with an earache, a baby, and you know the tools you have are not adequate, and the baby could have deafness, the baby could die because the *pneumococci*[48] are resistant to penicillin,[49] which it used to be exquisitely sensitive.

Now, I guess, the new role of vaccines is what's going to be, I hope—it's the organisms themselves, the products that they make, that can immunize the body so that the body can fight. The immunology[50] is the most tantalizing thing of this era, and what we've learned from AIDS is what has helped immunology: the role of the T-cells[51], the B-cells[52].

I'm not a virologist, but this information—this key information—has made a difference in our control of disease in this era. And, probably, will replace, I hope, the whole loss of antibiotics. I hope so.

CP: One of our earlier speakers, visitors, said there's nothing like a good epidemic to put a shot in the arm of the public health laboratory. And you're suggesting that the AIDS epidemic was really a shot in the arm for giant steps in laboratory technology and in our understanding of the basic pathogenesis of disease. Did I hear you saying that?

MS: Yes, but also with tuberculosis[53]. It was these AIDS patients getting tuberculosis that was resistant to the antibiotic, and it has made a great difference in the knowledge of

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48 *Pneumococci* are a bacterium associated with pneumonia and some forms of meningitis.

49 Penicillin is an antibiotic produced naturally by certain blue molds, but can also be prepared synthetically. It is used to treat many kinds of infections caused by bacteria.

50 Immunology is a branch of biomedical science that covers the study of all aspects of the immune system in all organisms.

51 T-cells are a type of white blood cell produced in the thymus (hence the name T-cell).

52 B-cells are a type of white blood cell that is produced and matures in bone marrow (hence the name B-cell).

53 Tuberculosis (TB) is a potentially serious infectious bacterial disease that mainly affects the lungs, causing fever, fatigue, and chronic cough with phlegm or blood. TB is treatable with multiple antibiotics.

tuberculosis. They've taken giant steps. Giant steps. Few hours compared to two weeks, three months. I think—

CP: When I first came, three months for a TB culture.

MS: That's right. And then, if you got a negative, you didn't know what it meant.

CP: That's right.

MS: That's right. And tuberculosis is a deadly disease. It's not anything that we want to come back—

CP: No, it isn't.

MS: —and these AIDS patients, being so susceptible to this organism, was a shot in the arm—

CP: —to our understanding of TB. Yeah, it was. Well, we can praise the Lord that we know more about TB and control it, but we aren't doing very well in the AIDS patient with TB, are we?

MS: I can't answer that. I don't know.

CP: It was my impression that—

MS: I'm not—

CP: Their characteristically resistant to the drugs, you know?

MS: That they are a different strain. The avian[54] strain, I believe.

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54 Viruses can originate as or develop an avian strain. Avian strains of viruses are so named because they primarily affect birds but can also infect humans.

CP: It’s very definite.

MS: Very resistant. But think about it. AIDS was an end disease, but now, there are some of them living a year, two years. We do have some drugs in this country, but in Africa and those other countries where it’s rampant, we’ve got to find something else for this disease. I’m not a virologist, but I’m willing to believe that there are other things besides AIDS that are taking some of these people out because they have no immune system, and the other diseases are still lurking in these countries, and we are as strong as our weakest link.

CP: That is so true, so true. For a young person starting out, you know, in a laboratory, you’ve made the point good that bacteriology is a still highly rewarding career. What course should they take? Suppose I’m a high school senior, what should I do to become a Minnie Schreiber?

MS: I don’t know. I think you have to care and want to study and be willing to change as things happen because there are not many schools of bacteriology now. They are molecular biology. And you have to be willing to be a part of what is and find your own direction.

CP: Your own niche in that.

MS: But wouldn’t it be nice to be able to do this? You have so many tools that we didn’t have, and then you can go beyond that—but there’s a lot to be done. There’s a lot that has not been worked on, but you have to be willing.

And there are many jobs—not necessarily in public health or in schools—but there are jobs in industry today. It’s very important to industry to learn, uh, about diseases, to find cures for these diseases, to find tests to diagnose these diseases. And if you wanted to be in industry today and work in this, you could have an opportunity to develop something or study in areas that would be interesting to you. It’s important that you want to do it, that you care what happens to the other fella because that’s important.

CP: That’s the beginning.

MS: That’s the beginning.

CP: Yeah, you've made that point loud and clear, and you have exemplified that in your professional life, Minnie.

MS: Well, it's important to me. And I learned from people like Carolyn Roth, who taught me much. And she was one person who did more for public health than anyone I know, and I really miss her.

CP: Yeah, it's good to remember her.

MS: Yes, it is. It's good to remember Carolyn, and her role was to make it good for the next fella.

CP: So, she was one of your models. Did you have others?

MS: Well, I'm sure I did. I was very fond of Dr. Sowder[55]. He was a wonderful health officer. Is that what his title was? Health officer?

CP: Yeah.

MS: If you had a problem that you didn't exactly know what to do, even though he was not in your area of expertise, he had some good old-fashioned advice. If you had a problem, he would tell you just what he thought and give you advice because there are always—even in the field of science—there are always other problems besides the scientific problems. You must learn to get along with your fellow laboratorians, you must always be honest in your answers, and we always had to care what it meant when our answers were delivered. There were people at the end of those answers.

We had public health nurses who were dedicated to what they were doing. And they would have an outbreak of *Shigella* in a daycare nursery, and they had all of these little children with enteric problems. And they were overwhelmed with the amount of work they had to do. And they needed the answers fast, so they could pull the diseased children out of the daycare center. Otherwise, they would be in the daycare center because the parents had to go to work.

55Dr. Wilson T. Sowder was a prominent figure in Florida's public health system for over 30 years. His dedication to Florida's health began in the 1940s, when he served as a venereal disease control officer with the US Public Health Service. Under his tenure as a Florida state health officer, he developed health departments in each of Florida's counties. Dr. Sowder was interviewed as part of the Florida Public Health Oral History Project on June 24, 1997.

I don’t know about daycare centers improving—I understand they still have *Shigella* outbreaks in these daycare centers, and that these children still have to be pulled out so their parents can stay home with them. And, in many cases, the caliber of the people working in these daycare centers is not adequate enough to care for these children, and their hygienic examples have much to be desired.

CP: Yeah, that seems to be largely so.

MS: It’s too bad that we can’t control an organism that’s been around—

CP: —as old as humanity itself.

MS: Yes. *Shigella*. And you’re really sick when you get this organism. It’s not just—it’s not a laughable thing, and these little babies would get dehydrated. It’s really sad.

CP: I laughed because I had it when I was at the monkey farm.

MS: You did? When you were at the monkey farm?

CP: Yeah.

MS: I remember when Dr. Prather was at the monkey farm. He would bring these specimens all the way, 100 miles away—

CP: No, 222 to be exact.

MS:—two hundred and twenty-two miles, and we’d wait for him to come—

CP: —after dark.

MS: —after dark, so we could set up these specimens. I don’t know, I can’t answer that. I’m not that familiar. But I still believe that they still have to do these kinds of procedures, overnight procedures, to get the organism to diagnose the disease. Maybe

we've cut two days, three days, but I still think we have to have 24 hours to make a diagnosis.

CP: I can't answer that either, except when a nursery got sent home and they had to bring in the stool specimen. It's 48 hours after the last stool before they'll know whether the child can come back or not. So, it still takes 48 hours for the laboratory to tell you the presence or absence of *Shigella*.

MS: Well, I think that could be cut down, but then I'm not privy to how they do it. It's important that you have a correct answer. It's important for many reasons.

A parent who can't go to work and has to stay home with a child who has been misdiagnosed has lost money—money that's needed to pay for food, for rent, for insurance. A child who has a wrong diagnosis is kept out of an area that it needs to be in, where it's cared for. A wrong answer is not easily excused.

CP: Yes. Why, thank you for that attitude, Ms. Schreiber.

MS: Well, I think—

CP: That goes under the heading "caring."

MS: That goes under the heading of wanting a correct answer, to doing it correctly, as well as caring. No matter what you do, no test is 100 percent, not even for AIDS, not even for any of the others. But you want to do the best you can. At least you want to feel that you have fulfilled your mission.

CP: Yes. Let me go back to the University of Kentucky. When you finished there, with your degree in bacteriology, did you have an aspiration toward a career in public health, or were you just interested in a laboratory where you could do bacteriology?

MS: I went to school in Kentucky with a group of very impressive scientists. One of them was Dr. Edward Cast, who ended up being in charge of the Channing Laboratory for

Harvard[56], and one of the most impressive scientists we've had in this era. And he was very encouraging for me to do research.

And I would have gone on to the University of Wisconsin in genetics, but the illness of my father prevented that. And I really didn't mind, as long as I got a job that was productive. And, even though I worked in research laboratories and the diagnostic laboratory for Johns Hopkins Hospital, I really knew very little about public health. And it was just happenstance that I came to Florida and found the job there—here.

CP: You found your niche there—satisfied all your basic needs, I gather.

MS: I found happiness in working for the state of Florida and the Bureau of Laboratories and some wonderful people. Including you, Dr. Prather.

CP: You stuck it out for 38 years.

MS: That's right. Those were long years, and I hope that we were useful in helping the laboratory be progressive and stay progressive. I'm sure it has changed, and I'm sure public health has changed. And it probably will privatize many of the procedures that we were using, or many of the tests that we were doing. But I will promise you, sometime—not, maybe, in our day—it will make full circle, and they will need public health laboratories again.

CP: Oh, I don't see them ever outliving their usefulness.

MS: No, it's not usefulness, but they're not doing the same things.

CP: Not today, yeah.

MS: Not today—not in our area, anyhow.

56The Channing Laboratory of Harvard University, officially called The Channing Division of Network Medicine, is a research division within the Department of Medicine at Brigham and Women's Hospital. The Channing Laboratory is primarily concerned with research in the areas of chronic disease epidemiology, systems genetics and genomics, and systems pathobiology.

CP: I don’t think so, but we’re innovating. I see all the innovation and the laboratory diagnostic stuff being worked out in the public health laboratories—we have the specimens. We have the hard data: what works and what doesn’t work.

MS: Will they be willing to finance them doing it?

CP: That’s a big question. Financing has fallen off in recent years, as you well know.

MS: Will they be willing to let them do this kind of activity? Are there any Dr. Hardys wandering around?

CP: I don’t know. I don’t know any.

MS: I think that you will find that many laboratories and many of the third world, underdeveloped countries—they are going to be needing public health-type laboratories, and, probably, that’s where they will flourish in the next century—

CP: Good thought.

MS: —rather than in this country.

CP: Now, I hope that it’s going to come around, though. That our leadership will see the advantage of having scientists—quote, table scientists, for lack of a better term—who are given the time and the dollars to be innovative, to research, to ask the questions, Why? And how come, is this not working, or, What do we need to do here? How can we cut the turnaround time? We’ve got to come back to that, Minnie.

MS: Will they be doing it in laboratories, public health laboratories, or will they be doing it under big centers like Mayo[57] or Cleveland—the Cleveland group[58]? Will they go away from the public sector? I don’t know.

CP: I don’t know, either, but I hope not.

57The Mayo Clinic is a nonprofit medical practice and research group. Employing over 3,300 physicians and scientists, it is the largest integrated nonprofit medical group practice in the world.

58The Cleveland Clinic is an academic hospital based in Cleveland, Ohio. It is owned and operated by the nonprofit corporation Cleveland Clinic Foundation.

MS: The people who are out there—they want good health. Good health is a commodity, not just good health. They will go to great ends to be sure they have good health.

Someday, they may demand that it come back. It may be the public sector that will demand it come back. I don't know. But they want good health and what goes with it, and they don't realize—or maybe they do. I don't know. I can't answer that.

Maybe the younger generation will care enough to look into testing, to make sure that they are quality controlled, that they're adequately done, and done by competent people. I hope so.

CP: Well, I think there's a message there for our viewers, and for the immediate future, our dominant viewer will be students of the public's health and students of the University of South Florida. We can make the point to them, based on your history of "Where is it?" and for them to use their influence to see to it that it stays where it's supposed to be, where the innovatives are. Give the viewer a message of what you'd like for them to do —future leaders of this state.

MS: Well, I don't think you should take good health for granted. I think that it is something that has to be worked out, not only for you and your families, but for all the countries in the world. If they need the assistance and the know-how, then we may have to go and help them with their problems. But we must also keep going forward in our own country, using the tools and the experiences that we have to keep working.

There will be new and difficult diseases, just as they were in our time. The more we used antibiotics; they became less useful. The more antibiotics a person took for a disease and that organism disappeared; then, the normal flora took over and became the disease organism and became one of the worst organisms that we have now—the *Staphylococcus*, the resistant *Staphylococcus*.

CP: Still.

MS: So there will be, every day, a new case for you to study. There will be a new challenge. Don't think all the problems have been solved. A new one will arise. And if you put your intelligence, your time, your thoughts to this—it's a challenge for you and will make for a useful and happy life.

CP: For you, and for me, and for others.

MS: That's right.

CP: Yeah. This is fun. This is fun, Ms. Schreiber. Looking at public health overall during your tenure, what's the most impressive development that you've seen—outside the laboratory, now—for public health at large?

MS: I don't know. I haven't been in the public health arena in an active way. I've been working in a medical environment. I am greatly intrigued with the Alzheimer's disease. It is a problem that one in four people of the age 85 is going to get. And we have a large number of elderly people who are living long lives in Florida.

It will be a public health, mental health problem. And the etiology of this disease and the ability to prevent this disease is what is intriguing me now. And it will be, I'm sure, a public health problem. But the role of public health in this disease, or the laboratory—a bacteriological laboratory in this disease—I have not evaluated.

I have worked with some of these Alzheimer's patients in a nursing home. And when you can see a mind going blank, and the individual you knew as a valuable member of the community, you know this is something you have to resolve. And I give this to you, students—a challenge to do something about it.

CP: Marvelous, marvelous. What have we left out?

MS: I don't know. I don't know what we've left out, but I have great appreciation for what you're doing because, in our instant coffee age, we think our problems can be instantly solved, and that's not so.

CP: Or, what it seems to me the public wants is a pill, Just make another pill for it. Pills solve all problems. Take another pill.

MS: I don't believe that's so.

CP: I don’t believe that’s so, either, of course. But I want the listeners to know that when I joined public health—almost 50 years ago, myself—Ms. Schreiber was one of my early instructors in bacteriology, and I love her to death. And Ms. Schreiber, on behalf of the University of South Florida and the College of Public Health, myself, and our videographer, Jane Duncan—we just thoroughly appreciated our visit with you this afternoon, and we thank you, sincerely, for coming by and taking the time.

I’m aware that you are leaving with us a number of reprints that you view as highlights in your experience with the public health laboratory. Those will be electronically available to anyone who wishes to see them.

And you’ve referenced the *State Board of Health Annual Reports*, which is a good document for anyone interested in the history of public health action in this state. You specifically referenced the typhoid outbreak in South Florida, 1973. But I would enlarge that, for any student interested in the history of the public health in Florida, the *State Board of Health Annual Reports* are just an excellent source to review.

Our viewers—they see a plaque that you are very proud of, which was presented to Ms. Schreiber, public health microbiologist, in appreciation of her 38 years of faithful and dedicated service to the people of the state of Florida by her friends and coworkers here in the laboratory and in the larger department—which, at that time, was HRS. And I want our viewers to see this, Ms. Schreiber.

MS: Important to enjoy what you’re doing. It’s important to look back on what you have done, and it’s important to move on to other areas and do more. We must give back what we have received.

CP: Yes, so strongly believed. Are you ready? Now, then, let me thank you sincerely, and I want the audience to know that I am Skeeter Prather. Thank you for joining us.

MS: You’re welcome! Thank you!

End of Interview