MGH News

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# Occupational Disease: A Problem That Lingers

## *"Strange Growth" Turns Out to Be Just That*

(*Third of a Series on Research*)

One day early in 1937 a technician showed Dr. Louis Dienes a culture dense with tiny colonies of growths.

"Dr. Dienes," Technician Marguerite E. Burke said, "there is a very strange growth here."

No bacteria were visible with the microscope. Dr. Dienes examined the culture with a special staining technique that revealed the nature of the tiny colonies. The mysterious growth was Mycoplasma.

Dr. Dienes chuckled as he recalled the irony of that day. The MGH bacteriologist was one of several scientists from all over the world who had spent years unsuccessfully hunting for that elusive organism in man.

"After all that searching I found it accidentally," he said. This is often true of important research discoveries.

French investigators had spotted Mycoplasma in cultures from an epidemic of cattle in 1898. Since it became evident that these organisms could cause serious disease in animals, scientists had searched for them unsuccessfully in humans.

In the 1930's an English researcher made some progress toward unlocking some of the organism's secrets. However, it remained for Dr. Dienes' chance discovery to find Mycoplasma in man.

The culture which his technician showed him came from a pus-filled gland (Bartholin's) that Dr. Langdon Parsons had removed from a patient. Dr. Parsons himself had cultured it looking for a common bacterium and turned the culture over to Dr. Dienes for study.

Later, Dr. Dienes also found Mycoplasma in cultures made from the mouth. No evidence has ever turned up of disease caused by Mycoplasma in the mouth.

Those organisms he discovered in the urinary tract area, however, can produce cystitis, an inflammation of the urinary bladder, and pyelitis, an inflammation of the kidney's basin-like structure called the renal pelvis.

*(Continued on Page 2)*

Social reform in England ended the practice of endangering the health of small children by using them to sweep soot from chimneys. This drawing was an illustration to an essay by Charles Lamb.

On September 1, 1945, her superior in the Department of Labor deposited a large file on Dr. Harriet L. Hardy's desk.

"Give this your whole attention, until the problem is solved," he said.

The folder was the information collected to that point on the illness of Massachusetts fluorescent lamp workers. And the study of this illness initiated for Dr. Hardy a crusade against occupational disease. In 1970, she is still wrapped up in it.

Job-related illness has been recognized at least since 1713 when Bernardo Ramazzini published a book on the hazards of 52 occupations – including wrestling, gravedigging and nursing. Legislative action and social reform started in the nineteenth century when the dangers to chimney sweeps and the women and children working in English mines aroused the public concern.

The United States has been somewhat behind Europe in correcting conditions hazardous to workers. In the 1920's, however, the dangers to luminous watch-dial painters, who pointed their brushes with their lips, caught the popular interest.

Since then, the situation has improved. "Many industries seek excellent medical and engineering advice and use it to control hazardous jobs," Dr. Hardy said. "Workmen's compensation statutes and state health and safety laws have caused great improvements in working conditions."

Dr. Hardy finds that there is still room for much more improvement, however:

"With the excitement over the dan-

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EDITORIAL:

# Lost in a Cloud of Pollution?

The days may be gone when children develop disease from cleaning soot-clogged chimneys, but disease caused by occupational exposure is still very much a reality.

As should be expected, things are not as bad as they were at the turn of the century. Just a few weeks ago Congress passed a bill setting safety and health standards in the coal mining industry. Such a law was long overdue. But over the years technology has brought with it safety precautions and devices in a variety of industries. It is also important that compensation has become available for accidents on the job. In contrast with accidents, however, diseases incurred by contact with harmful substances are far from adequately covered.

As a story on page 1 points out, the laws themselves, as well as the practical operation, are partially to blame. Few states require the reporting of diagnosed occupational diseases, so the extent, even of a serious concentration of job-related illness, may go undetected and uncorrected.

Some state laws do not allow for the delayed onset of some diseases, limiting compensation to only those cases which occur up to three years after exposure. In other states, compensation becomes available only when a disease appears on a list of established illnesses. This ignores the possibility of a new substance in our ever-innovating industries proving to be detrimental to workers' health.

Once occupational disease is suspected, industry's adherence to trade secrecy and its reluctance to cooperate with investigation for fear of court and compensation costs make the doctor's already difficult diagnosis even more so. Once in court, the power, personnel and time wielded by large industry can make obtaining compensation a great hardship for the individual worker and his doctor.

Although diminished by comparison with 70 years ago, the problem of occupational disease clearly remains. The very fact that it took until 1969 to get a reasonably adequate mine safety bill through Congress is indicative of the power that big industry exhibits in warding off constructive reform. And with the growing alarm about pollution, the issue of the health of individual industrial workers will be crowded into the background. This is understandable. Certainly pollution has become a grave problem that threatens the very existence of mankind. Beside it, the issue of the health of individual workers looks small. Yet occupational disease still strikes thousands of people and presents a problem that humanity should not lose sight of in the much larger cloud of pollution.

# *"Strange Growth" Proves Just That*

*(Continued from Page 1)*

When antibiotics came into use in the 1940's, both of those diseases became curable. It was found that streptomycin wiped out the Mycoplasma-caused infection in a few days.

Dr. Dienes related the dramatic case of a man with cystitis who had been discharged from the Army.

"He was made an invalid by the disease. He went to a number of hospitals, and they had been unable to do anything for him.

**Role in Abortion**

"The patient was then admitted to the MGH, treated with streptomycin and cured in two days."

One species of Mycoplasma was discovered by Dr. Monroe D. Eaton of Harvard Medical School to be the cause of primary atypical pneumonia.

More than 30 years after Dr. Dienes' discovery, there are no other human diseases, besides the above, known to be caused by Mycoplasma. But there are other possibilities.

Recent work by Ruth B. Kundsin, S.D., of Harvard Medical School and

Rod-shaped bacteria.

The *MGH News* welcomes letters from its readers. To avoid condensation, letters should be brief and must be signed. Names will be withheld on request.

With its February issue the circulation of the *MGH News* increases to about 60,000. The expanded list of subscribers is being computerized. The operation is a complicated one and undoubtedly mistakes will be made in the initial months. Your patience and understanding are appreciated.

Peter Bent Brigham Hospital, shows that Mycoplasma may play a role in natural (spontaneous) abortion in some women. Two such women, each with a history of six prior spontaneous abortions, gave birth to normal children after treatment with antibiotics.

There is some highly debatable evidence that the organism may cause or at least play a role in one kind of arthritis. Mycoplasma is known to cause severe arthritis in various animals.

The same organism is often found together with other bacteria in pus-producing conditions. Even if Mycoplasma plays a role in causing them, investigators have been unable to expose this role.

Now researchers are finding that the same ubiquitous organism may cause plant disease.

In a strict sense, Mycoplasma is not a bacterium. It is unique in that it lies midway between bacteria and the viruses in many respects.

### Resembles L-Form

What Mycoplasma most resembles is the L-form, another mysterious organism which Dr. Dienes has been studying for more than 30 years. At first scientists confused Mycoplasma and L-forms, so similar are they.

Dr. Dienes was able to prove that apparently unlike Mycoplasmas, L-forms come from bacteria that have suffered an injury to the cell wall.

"Under certain circumstances," he said, "L-forms may resume bacterial forms. They grow a new skin, as it were."

### Exciting Leads

Despite their name, L-forms come in a variety of shapes and structures. Many of them, however, have a shape, size and fine structure much like the Mycoplasma.

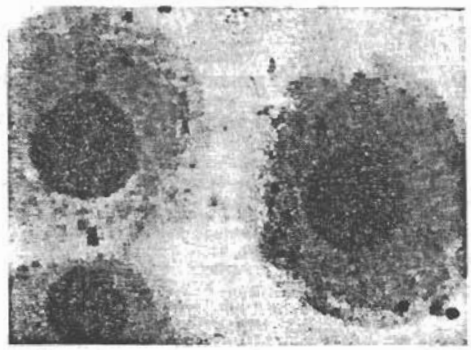
At present, though, scientists have been unable to produce evidence that L-forms take part in human infections.

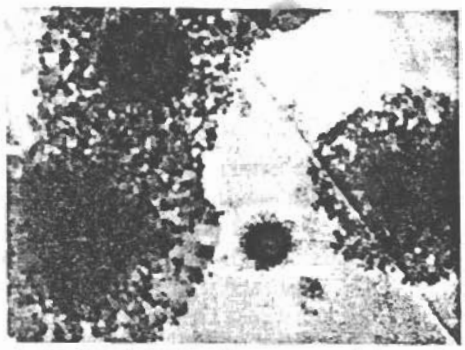
Yet investigators are coming up with some exciting, though puzzling, leads. They are finding that in several infectious diseases, bacteria are altered in such a way that they look like L-forms – even though they are not.

Scientists under Dr. Dienes, and in other laboratories, are continuing to follow such leads.

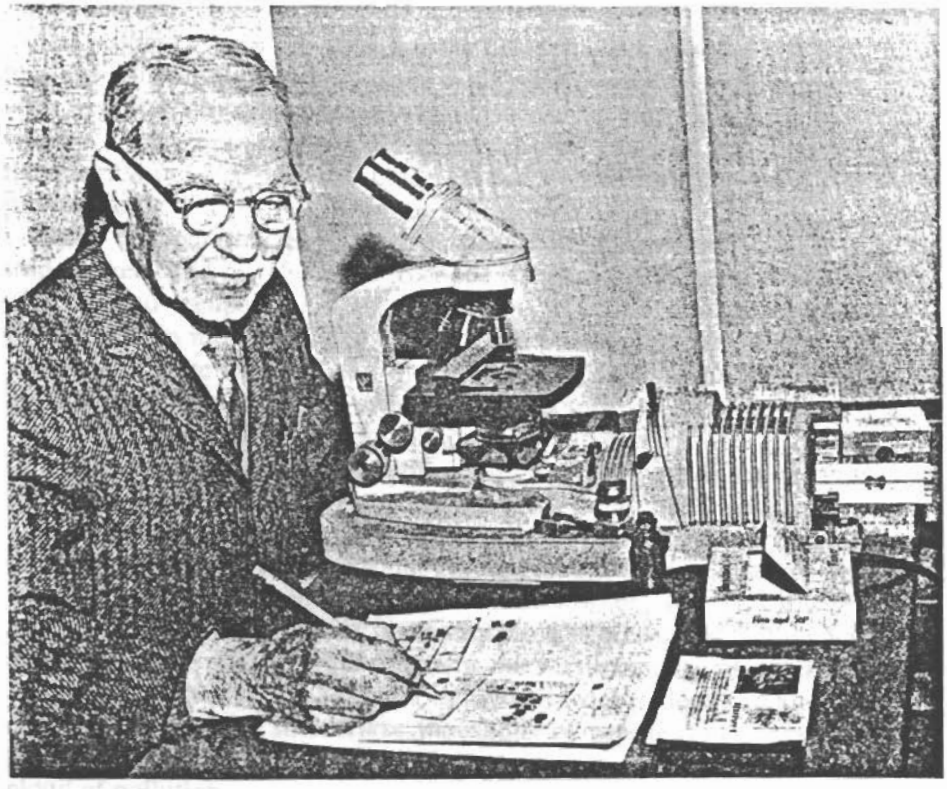
Besides its basic research, Dr. Dienes' laboratory examines cultures from patients for suspected Mycoplasma infection. A permanent fixture at the MGH, the laboratory has also become an early-warning center for Mycoplasma detection. Mycoplasmas have a nasty habit of turning up in tissue cultures used in all kinds of experiments. In no time at all, they ruin the cultures and set back a research project months or even years.

Many investigators routinely send their tissue cultures to Dr. Dienes' laboratory for Mycoplasma detection. Should the organism turn up, the laboratory can check its growth before it delays research for many months.





Mycoplasma colony in photograph on left shows characteristic "fried egg" appearance. L-form of bacteria appears on right. Note resemblance to Mycoplasma. Dr. Dienes took both photographs.



DR. LOUIS DIENES

## Two of Hospital Laboratories Were Over Ambulance Shed

A kindly man with a white mustache and a warm smile, Dr. Dienes came to the MGH as Bacteriologist in 1930.

He had worked in another area of research and made valuable contributions to the study of tuberculin hypersensitivity.

"Laboratories were far less elaborate then," Dr. Dienes recalled. "The pathology and bacteriology laboratories were situated over the ambulance shed.

"Only seven people worked in pathology at that time, and two in bacteriology, but the department already had an international reputation due to the work of Dr. James Homer Wright and Dr. Tracy B. Mallory."