The Star

RADIATING THE LIGHT OF TRUTH
ON HANSEN'S DISEASE

APRIL - SEPTEMBER 2003
VOLUME 62, NO, 2&3
$2.00 PER YEAR











Dr. Paul W. Brand (1914-2003) Dr. Ronnie Mathews

Dr. Brand advocated and treated each patient as a person. He once said, "the most precious possession any human being has is his spirit, his will to live, his sense of dignity, his personality. Once that has been lost, the opportunity for rehabilitation is lost. Though our profession may be a technical one, concerned with tendons, bones and nerve endings, we must realize that it is the person behind it that is so important." One of his patient's stated, "I didn't only receive the benefit of his professional skill, but also the privilege of his sincere friendship, Christian love and compassion."

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April -September 2003
Vol. 62, Issues 2&3

Cover Photo by Tanya Thomassie & Jerry Simmons

Stanley Stein

Founder - Editor, 1941 - 1967

The purpose of **The Star** is to: 1) Promote an educated public opinion of Hansen's disease, 2.) Furnish vocational rehabilitation for interested patients.

Views expressed in **The Star** are those of patients of the Gillis W. Long Hansen's Disease Center at Carville, Louisiana, except in the case of direct quotations or signed articles.

The Star (ISSN: 0049-2116) is now published **quarterly** by patients of the Gillis W. Long Hansen's Disease Center, Carville, Louisiana.

After you have read **The Star**, please pass it on to a friend and if **The Star** reaches you at a library, please place it conveniently for readers.

Editorial Policy On Terminology

The Star stands firm in its opposition to the use of the term "leprosy." We shall never abandon our campaign to secure general acceptance of "Hansen's disease." Nevertheless, the word "Leprosy" does appear in **The Star** under circumstances which we feel are unavoidable, namely: when signed articles are authored by someone who does not agree with us or when material discusses the disease prior to the introduction of the term "Hansen's disease." We dislike the word "leprosy" intensely, but we dislike the practice of censorship even more.

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THE COLORFUL CHARACTERS OF CARVILLE

Part 6

by Julia Rivera Elwood

Dr John R Trautman

After serving 33 years in the Public Health Service Commissioned Officers Corps, Dr John R Trautman, Assistance Surgeon General, retired as Director of the Gillis W Long Hansen's Disease Center, (now known as The Gillis W Long Center) Carville ,in which position he served for 20 years.

In 1996, the Museum Committee voted to name the museum at Carville in honor of this beloved physician leprosy expert. He is an international man participating in numerous meetings and conferences on Hansen's disease among them, five International Congresses of Leprosy. Trautman has served as a consultant on Hansen's disease the world over visiting places such as Okinawa, Tunisia, El Salvador, Mexico, Canal Zone and Argentina.

Trautman played a major role in the Eighties to increase the use of the term Hansen's disease. He worked to reword Public Health Service manuals referring to HD. The term, which has been advocated by The STAR magazine since 1941, is now officially accepted by the PHS.

A native of Omaha, Nebraska, Trautman and his wife, Margaret, who have three children, now live in Spring Hill, Florida. He regards Carville as a very special place having lived on the grounds for 26 years. "Working with Hansen's disease has been a privilege and working with patients has been inspirational," he stated.

His belief is that HD in the United States will be controlled indefinitely if the means by with it is being controlled remains intact. Maintaining the Center as a treatment, research and training facility and working in concert with regional HD Centers and private physicians is the answer.

Dr Robert R Jacobson

Robert R Jacobson, MD, Ph D., was named Director of the Division of National Hansen's Disease Programs and Director of the then Gillis W Long Hansen's Disease Center at Carville in 1992, before his retirement on July 1, 2000.

A native of Austin, Minnesota, Jacobson has worked at the Center since 1966 as Chief of Medicine and in 1978 became Chief of the Clinical Branch. Besides his various other duties as administrator, he was in charge of all investigational drug studies conducted at the Center His research interests lie not only in the investigated drugs, but in the metabolism of anti-leprosy drugs, epidemiology and control of HD, and immunoregulatory activity in HD patients. He initiated multi-drug therapy for HD at Carville in 1971 well before it became standard therapy elsewhere.

In addition to being clinical instructor at the LSU School of Medicine in New Orleans, Jacobson regularly lectures on the diagnosis and management of Hansen's disease (HD) and other related topics at Center seminars and elsewhere in the United States and other countries.

He is an international man who has been consultant on HD for the World Health Organization to the Peoples Republic of China on numerous occasions since 1985 and has participated in most of the International Congresses of Leprosy held all over the world. His WHO consultantships have also taken him to Japan, South Korea, Malta, The Philippines, Vietnam, Thailand, Malaysia, Western Samoa, Switzerland, Fiji, Venezuela, India, The Netherlands, France and Mexico, where he shares his expertise and many years of experience in drug treatment and control of Hansen's disease and multi-drug therapy. In many of these countries he is brought in to evaluate their HD control programs.

A member of the Public Health Service Commissioned Officers Corps sine 1966, Jacobson, who has the rank of Captain, has received several awards for his work at Carville including the Public Health Service's highest award, the Distinguish Service Medal. His publications are numerous and he has contributed chapters in leprosy textbooks and other books. Jacobson, who is married to Alice and has three children, is one of the leading experts in the field of leprosy and known all over the world.

JOHN P. EARLY

John P. Early's flamboyant life was a positive means which he used to call attention to the needs of the leprosy patients of his time and to better the conditions of the Carville facility.

Early was a veteran of the Spanish American War when he left the Army to marry a Salvation Army worker with whom he had two children. They later divorced. By trade, he was a carpenter and cabinet maker.

From the Army and Navy Advocate, November, 1933, "Early served with Major I.P. Blade, secretary to Congressman Hoeppel, in the Philippines. Major Blade recalls that in an attack on a barrio and its subsequent destruction, Early carried an old decrepit man -- probably a leper -- from one of the shacks while the barrio was burning."

Born in 1873 in Tryson, NC, he was diagnosed with leprosy at 35 years of age while living in Washington, DC. He was placed under quarantine in Washington, where he lived in an abandoned farmhouse just a few miles from the heart of the city. An armed guard was posted about the premises and his wife and children were in another house a few hundred yards away. They would sing old hymns and he would watch his son play (not able to touch him). He was sent to New York City for treatment, then to Penikese Island, and finally to Carville.

From Carville, Early wrote a letter to Franklin D. Roosevelt on December 24, 1934. He called the Carville Hospital a "quarantine prison" and he continued, "forcibly making me pay $135 of $150 pension award for such quarantine hospital which is given free to all other citizens and handing me back $15 is a most flagrant distortion of constitutional justice."

Early wrote to the Veterans Administration Claims Director on February 9, 1935, Washington, DC, "even criminals under compulsory restraint cannot be forced by any law to pay for their maintenance."

John Early played the game of hide and seek for 19 years. He "escaped from" the hospital and was brought back by Public Health authorities numerous times. Members of his family engaged attorneys and were prepared to fight to the last for the right of their relative to spend his remaining days on an isolated tract of land in the mountains of North Carolina.

Early's most dramatic appearance in the outside world was before a Congressional committee considering the bill to authorize the federal government to take over Carville. Members of the committee were frightened by the man's announcement of his identity upon his entering the committee room. It was reported that Early remained in the room until the committee had reported on the bill and then submitted to custody.

He surrounded himself by three or four newspapermen who had been called by him and startled congressmen by registering at a hotel which they frequented in Washington, DC.

On one of his appearances in Washington, DC, Early wandered into the police headquarters and everyone left hurriedly except a Post reporter and one policeman. They talked to him, persuaded him to depart, and followed him to Union Station. There, it was learned, he spent a $2 bill. For several days thereafter, residents of the city refused to accept a bill of this denomination when receiving change.

Quoting Theodore Tiller, Atlanta Journal, May 1, 1927, "The philosophy of the man; his habits of coming back to Washington and telling the health department that he is back; his way of walking out of restraining institutions when the mood so moves; his protestation that he is a leper although in a leper colony; and his seeming cheerfulness under an endless affliction, apparently give to John P. Early a distinction, unfortunate as it may be."

John Early titled one of his writings, "A condensed explanatory of the sad conditions and sorrowing hurts of a lifetime quarantine." His last escape was recorded in 1923. He was discharged in November 1928 to go to North Carolina. By the end of his life, he became crippled and blind. He died at Carville on February 25, 1938, and is buried in the Baton Rouge National Cemetery.

BERNARD PUNIKAI'A

Throughout his adult life, Bernard Punikai'a has been an untiring advocate of people's right, especially and particularly, the rights of persons with Hansen's disease.

His latest venture in advocacy is serving as President of **IDEA** (International Association for **I**ntegration, **D**ignity and **E**conomic **A**dvancement). This organization includes anyone who is interested, but the benefactors of it are the disadvantaged and disabled, including persons who have had Hansen's disease. In this capacity, he was a member of the planning committee, participated in the opening ceremonies and spoke at the banquet for the opening day of the "Quest for Dignity" Exhibit at the United Nations Exhibit Hall, New York City, in November 1997. As a tribute to all those patients who went before him, Punakai'a wrote a song, "Out of Darkness," especially for the exhibit.

In September 1998, he attended the 15th International Congress of Leprosy held in Beijing, China, and actively participated in the social aspects seminars and workshops.

Reflecting back on time, this Hawaiian entered Kalihi Hospital at the age of six years old. He went to Kalaupapa Settlement, on the Island of Molokai, to live when he was eleven. In 1973, Punikai'a came to Carville. During that time he received the GED certificate for high school equivalency from Sunshine High School. He has taken courses on Public Advocacy and the Hawaiian language from Leward Community College, and Business Law and Public Planning from the University of Hawaii School of Public Health. He served as chairman of the Kalaupapa Patients' Council for many years; Vice president of the Kalaupapa National Historic Park Advisory Committee; President of the Democratic Precinct in Kalaupapa; Board member of the Western Hansen's Disease Institute; served two terms (8 years) as a member of Hawaii State Board of Health which is a governor-appointed post and approved by the legislature; involved in the Hawaiian Sovereignty movement; ran for the House of Representatives and for Office of Hawaiian Affairs for the State of Hawaii; was a member of the St. Francis Catholic Church Choir which made a recording of a musical tribute to Father Damien, proceeds of which went to establish the Father Damien Museum in Waikiki.

He is a world traveler who went to Belgium for the beatification of Fr. Damien along with more than 50 other Hawaiians; attended four International Leprosy Congresses; and made a trip to Japan where he went to visit the Museum for Hansen's disease.

Of all the things which he has done in his life Bernard and his friends agree that being the leader of the Hale Mohalo Ohana organization has been the greatest accomplishment in his life. He is presently Vice President for the coalition for Specialized Housing, the new name of the same organization, which fought the government for Hale Mohalo, a Place which was set up for HD patients in Honolulu. The government wanted to take it and tear it down to use it for another purpose, but Bernard and other persons with Hansen's disease had another idea. After years of protesting, demonstrating (for which he was arrested), and political maneuvering, they were successful in not only retaining the place but in building a $7 million 210-unit housing facility on the site. It is called the Hale Mohalo (House of Comfort) Senior Projects for the elderly, and disabled, and some persons with HD are living there. The wings were named after those patients who helped with the struggle. And as usual, not only did he not get his name attached to this building, but he doesn't live there. Even though he spends a lot of time in Honolulu, Bernard calls Kalaupapa, where he arrived in 1942, his home.

Punakai'a is a philosopher, a comedian, a singer, composer and musician, a politician, a protestor and demonstrator, a student of life, a people's rights activist, an accomplished human being who has lived his life as a dignified struggle.

JOSÉ RAMIREZ, JR.

A native of Laredo, Texas, José Ramirez, Jr. comes from a proud and loving Mexican-American heritage. To know the kind of positive and upbeat person that he is now, one would never guess that this handsome man was diagnosed when he was a teenager in School and suffered much physical pain and discomfort, emotional and psychological stress when he was diagnosed with Hansen's disease (leprosy). Admitted to the hospital at Carville in 1969, he blazed the trail for others to attend college under the auspices of the Louisiana State Rehabilitation Department while being hospitalized at Carville. After he received his bachelor's degree, he went on to obtain the Master's in social work.

Married to his high school sweetheart, Magdalena, with whom he has two children, Ramirez lives in Houston, Texas. He has been employed by the Texas Department of Mental Health and Mental Retardation in different capacities through the years, the latest position being Department Head of Resource, Quality and Training

where he is responsible for a staff of 25 and a budget in excess of $3 million. His prior experience has been working with the Louisiana Community Coordinated Child Care (4-C) Program, taught at the Department of Social Welfare at Southern University in Baton Rouge, LA, and the Chicano Training Center, Inc., Houston, as coordinator of Training and Curriculum Development.

His publications, most of them having to do with social aspects, some especially and particularly dealing with the problems and social stigma of Hansen's disease -- subject near and dear to his heart -- are many. They have been published in professional journals, newspapers, magazines, and newsletters. This energetic person is constantly plugging education of the public about the facts of Hansen's disease and believes that "Education is the key," which is the title of one of his articles.

Going along with his promotion of education in all social aspects, this man who has the gift of gab and charisma to boot, has numerous presentations which he has made to groups up to 800 people including areas of culture, mental retardation, Hansen's disease, people power, mental illness, prisons and parolees, e.g. a presentation to MHMR's Hispanic Heritage Celebration in Houston and to the National Association for Social Workers Texas Conference, Arlington, Texas.

On his favorite subject, Hansen's disease, he has participated in panel discussions, made presentations at the University of Texas of Public Health; the Gillis W. Long Hansen's Disease Center, on the occasion of its Centennial in 1994 (and shared the stage with James Carville); the 55th International Congress on Leprosy, Washington, DC.

In September 1998, he attended the 15th International Congress of Leprosy held in Beijing, China, and actively participated in the social aspects seminars and workshops.

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This is the conclusion of "Colorful Characters of Carville". The STAR wishes to thank Julia Rivera Elwood for her "Colorful"contributions.

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(Gram-positive Non-acid fast Coccoid) **-Cont'd from page 14**

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Gram-positive Non-acid-fast Coccoid Micro-organisms Cultivated from the Hansen's Disease Patient Specimens, and *M. leprae*.

Tsunehiko Hirata*
Phrapradaeng Hospital (Thailand)

Key Words: Gram-positive coccoid, Acid-fast bacilli
Cyto-morphological changes
Compatible nutrition
Hypo-nutritive condition

Since Hansen GA., after observing the Hansen's disease (HD=Leprosy) bacillus in the lesions, made the first unsuccessful attempts to cultivate it outside the host, as reported by Terni (1950) (13) a long time back, a great number of research workers have claimed that they have succeeded while others even now are doubtdul that cultivation of the bacillus has been accomplished.

The form or morphology of the HD bacilli is diversified with long and thick bacilli in nasal mucosa, solid or nonsolid forms in the skin nodule, and very tiny or small bacilli in the peripheral nerve. This diversity of the organism cannot be explained by conventional bacteriology. If it is being explained, there must be some powerful supporting factor or observation and convincing evidence.

It is said (14) that the microorganisms most commonly isolated and known as the results of pioneering research work on leprosy bacilli are included in the following categories: (a) strains belonging to diphteroid bacilli which were either non-acid-fast or non-chromogenic acid-fast bacilli, (b) chromogenic acid-fast bacilli, (c) non-chromogenic acid-fast bacilli and (d) anaerobic bacilli or actinomyces.

Amongst such microorganisms, the Gram-positive non-acid-fast coccoid organisms are of compelling interest as observed and examined by Delville (8) and Chatterjee (1-7). The organisms are easy to be stained with Gram's method and to be cultured on media. From the bacteriological observations of their properties, they may be seen at a glance as so called contaminants or various bacilli, though they show cyto-morphological changes. Kato said *M. leprae* has a Janus-face (9-12).

The present report is the result of bacteriological observations of the Gram-positive non-acid-fast coccoid microorganisms cultivated from HD patient specimens.

1. *Leprosy materials used for the establishment of bacteriologic experimental methods to cultivate coccoid organisms, and isolation frequency of Gram-positive non-acid-fast cocci from HD patient specimens.* (Table 1.)

It was not so difficult to find Grasm-positive non-acid-fast coccoid organisms from the HD patient specimens, under the microscope.

2. *Primary isolation procedure of the cocci from clinical specimens of HD patients*. (Table 2)

The ingredients of culture medium (BIM) for the primary incubation of clinical materials from HD patients were very simple. The pH was alkalinized.

3. *Pure- and sub-culture.* (Fig. 1 and fig. 2)

A well-norished medium was not required for the incubation of the cocci. The organisms were originally isolated from the materials and cultures maintained on BHI (Brain Heart Infusion) agar medium at 37° C. BHI medium was appropriated as the leading culture medium.

4. *Examined growth media for the cultivated cocci (at 37°C) and the results*. (Table 3)

The organisms were able to grow in several kinds of media.

5. *Properties of the cocci grown on BHI agar medium.* (Table 4)

The organisms grew over a ph range of 5.5 to 8.5. The cells could grow in NaCL concentrations ranging from 0 - 20.0 on BHI medium, and the colonies became slimy along with an increase in NaCL concentrations. Catalase test was positive.

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6. *Culture characteristics for distinguishing the cocci from STAPHYLOCOCCI and ENTEROCOCCI*. (Table 5)

There was ao yellow halo on Vogel-Johnson basal medium. It means that the organisms do not belong to the group of Staphylococcus sp., and are not Enterococcus sp. because of no growth on EF agar medium. And also, the cells did not grow on MacConkey agar medium.

7. *Incubation procedure for the observation of cyto-morphological changes of the cocci at the level of microscopic appearance.* (Table 6)

The cyto-morphological changes of the coccoid cells were studied by means of inoculating and incubating the cells in a different media.

The cells were observed with cellular debris-like complex, stained faint blue and it seemed to become difficult to distinguish the spherical form as coccoid cells in the complex after long incubation in the medium of No. 147 to give rise to hypo-nutritive conditions (Fig. 3 and 4).

The cells transplanted from the medium of No. 147 broth were, after several weeks, incubated on the medium of No. 138. Any colonial aspects were not observed on the medium within the limits of macroscopic observations. Smears from the surface of the medium were, consequently, made by placing a small drop of bacteria-free water on a clean slide, transferring a drop from the surface of the medium with a loop, and gently mixing. After allowing to dry, heat-fixed smears were ready for acid -fast staining. A close examination under the microscope showed some forms of indistinguishable appearance, and morphological descriptions were difficult.. They were not so easy to be stained as acid-fast and displayed light purple tints. Small granules and/or slim-tiny rod-like forms were observed in the appearances (fig. 5-1-1 and 5-2-1).

(Let it be emphatically said the coccoid cells grown successfully on BHI agar medium were allowed to proliferte on No. 138 medium.)

The catalase test was done by adding 1 mL of 3% hydrogen peroxide solution to No. 138 agar slant of the cells, and the production of bubbles was not observed. This result was worthy of note and all-important.

8. Micro-organisms observed in foot pads of mouse incubated with the materials collected from the No. 138 agar medium, which materials had been incubated in the medium of No.147 in advance and transplanted to. No. 138 agar medium.

As the observation term was short, the results were very very poor (Fig. 6 and 7).

9. *Cultivation results of the materials collected from No. 138 agar medium on BHI agar medium, which materials had beenincubated in the medium of No. 147 in advance and transplanted to No. 138 agar medium.*

Any colonial aspects were not observed on BHI agar medium.

The last word has not yet been said on this subject and the present observations were not sufficient to explain the direct reciprocity between Gram-positive non-acid-fast coccoid organisms and leprosy bacilli. Even so, the foregoing observations may be summed up briefly as follows: whenever coccoid cells, which kept on much longer under hypo-nutritive conditions and might remain in a dormant state (for years), are eventually brought into favorable environment for bacillary growth, they develop into tiny-slender vegetative forms. Most likely, the vegetative form arises by gradual elongation of the small coccoid organism, vaguely suggestive of germination (Fig. 8).

It is said that following this reasoning to a logical conclusion, maybe there is a way to be detected on a new bacteriological esearch line of the leprosy bacilli, reconsidering the studies on the cultivation of the organisms in vitro so far.

Aknowledgment: I wish to express my sincere thanks to all of the staff at the National Phrapradaeng Hospital in Thailand, JST (Japan Science and Technology Corporation) and JICA (Japan International Cooperation Agency) , Who helped in this srudy.

[**Editor's note:** Recent sequencing of the genome of *M. leprae* has revealed that the bacterium lacks the genes coding for certain enzymes involved in energy synthesis, explaining it's inability for independent growth**.]**

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Table 1. Leprosy Materials used for the Establishment of Bacteriologic Experimental Materials to Cultivate Coccoid Organisms, and Isolation Frequency of Gram-positive non-acid-fast Cocci from Hansen's Disease Patient Specimens

Leprosy Materials	Clinial Type						Total	Culture cases of Gram –positive *Cocci*
	L		B		T			
	M	F	M	F	M	F		
Skin Biopsies	18 (1)	4	3	6	-	1	32	(1)
Plantar Ulcers	-	1 (1)	-	-	3 (3)	3 (3)	7	(7)
Skin Smears	34 (19)	29 (11)	25 (13)	14 (9)	5 (1)	-	107	(53) 53/107=49.5%
Skin Scales	-	1	2	1	-	-	4	
Blood	56 (1)	16 (3)	29 (1)	9	16	7	133	(5)
Blood Sera	5	3	1	1	-	1	11	

L: Lepromatous lep., B: Borderline lep., T: Tuberculoid lep.
M: Male, F: Female ( ): Culture cases of Gram-positive non-acis-fast cocci

Table 2. Primary Isolation Procedure of the *Cocci* from Clinical Specimens of Leprosy Patients.

Specimens±

|

To be inoculated to BIM* directly

|

To be left in the incubator for several days

|

To be inoculated into solid nutrient or BHI agar medium with one or two drops of the inoculum by a capillary pipette

|

To be left in the incubator at 37°C in air for several days

|

••••••••••

|

Isolation "Pure colonies of the *Cocci*"

BHI: Brain Heart Infusion

BIM*: Basic Incubation Medium

Potassium Phosphate, dibasic	25.0 g
Polypetone peptone	10.0 g
D-Mannitol	10.0 g
Yeast extract	5.0 g
Sodium chloride	5.0 g
Distilled water	1,000.0 ml

ph 9.0 ± 0.2

Table 3. Examined Growth Media for Cultivated **Cocci** (at 37°C).

1% Peptone Water Med.	+
Alkaline Peptone Water Med. (ph 8.5 - 10.0	+
Nutrient ILiquid and/or Agar) Med.	+
Heart Infusion (Liquid and/or Agar) med.	+
Brain Heart Infusion (Liquid and/or Agar) Med.	+
Soil Extract (Liquid and/or Agar) Med.	+
DNA (DNAse) (Agar) Med	+
MacConkey (Liquid and/or Agar Med.	–
EF (Agar) Med.	–
Vogel-Johnson Basal (Agar) Med. (Tellurite–)	+
Vogel-Johnson Basal (Agar) Med. (Tellurite +)	+
CTA (Crystine Trypticase)Agar) Med.	+
NAC (Nalidixie Acid-Cetrimide) (Agar) Med.	–
Dubos Tween Albumin (Liquid) Med.	+
Sauton (Liquid) Med.	±(+?)
Egg Med. (Malachite Green +)	±
Egg Med. (Malachite Green –)	+
Sabouraud (Liquid and/or Agar) Med.	+
Corn Measl (Agar) Med.	+
Czapek Solution (Agar) Med.	+
Mycosel (Agar) Med.	±(+?)
Zein (Agar) Med.	±(+?)
Gam (Agar)	+
Cooked Meat (Liquid) Med.	+
Liver Broth Med.	+
Thioglycolate Broth Med.	+
Urea (Agar) Med.	±(+?)

\+ = Cultivable
±(+?) = Not so clear
– = Uncultivable

Continued on page 12

AN EFFECTIVE RATIONAL CHEMOTHERAPY FOR DRUG-RESISTANT TUBERCULOSIS AND LEPROSY

K Prabhakaran*
[Coworkers: EB Harris, B Randhawa]

Tuberculosis caused by *Mycobacterium tuberculosis*, and **Leprosy** caused by *Mycobacterium leprae* continue to be a serious public health problems in many countries. Tuberculosis is the leading global cause of death from infectious diseases. According to the **WHO**, one-third of the world population is infected with *M. tuberculosis*; about 2 billion people are suffering from active tuberculosis, which is responsible for 2-3 million deaths annually. About 8 million new cases appear every year; everyday 23,000 people develop tuberculosis, and bout 5,000 die of the disease. Highest numbers of cases are found in sub-Saharan Africa, India, China, The Philippines, Bolivia and Peru. The epidemic is spreading in Eastern Europe and Russia, and progress in controlling the infection is very slow. In Russia, TB results in approximately 30,000 deaths a year. One- third of the world's TB patient population is in India. *M. tuberculosis* is a highly adapted organism that parasitizes macrophages. The bacterium survives for prolonged periods within phagosomes of infected macrophages in a latent state; it can reactivate years later when the host's immune system wanes.

The spread of multi-drug resistant *M. tuberculosis* has made control of the infection more difficult. 2-3% of all new cases are due to the **MDR** strain. Patients who are resistant to INH are given rifampin and pyrazinamide in addition. Rifampin resistance is considered a surrogate marker of MDR TB. Mycobacteria insensitive to seven different drugs have been identified. Antimicrobial resistance has dominated recent reports about bacterial infections. Four general **mechanisms of multi-drug resistance** have been observed. 1. Detoxification by enzymatic cleavage or modification of the drug. 2. Genetic alteration of the extracellular targets. 3. Decreased permeability of the cell membrane. 4. Active drug extrusion by multi-drug transporter efflux pumps.

Non-adherence to treatment regimen by patients is a major cause of multi-drug resistance. To combat the problem, **DOTS** (directly observed therapy, short course) was introduced. Strict adherence to the procedure has brought down the incidence of TB to 6 per 100,000 in USA. Because of the high cost per patient per year, many endemic countries cannot afford the treatment. Recently even costlier **DOTS Plus (**where additional toxic drugs are incorporated**)** has been proposed. In treating MDR TB, the regimen is ineffective unless implementation is optimal. Now rapidly bactericidal **quinolones** are being tried when other drugs fail. The Global Alliance for TB Drug Development will sponsor a 2 year project at Korean Research Institute to introduce more effective quinolones for TB control.

However, all pathogenic bacteria against which various quinolones have been tried ultimately developed resistance against them. Quinolone resistance is mediated by a gene *qur* that encodes a protein that protects DNA gyrase. No consistent results were obtained by recent trials of **DNA vaccines.**

When WHO introduced multi-drug treatment against leprosy in the 80s, using dapsone, rifampin and clofazimine, it was estimated that there were 10 million patients in the world. For multi-bacillary patients, the duration of treatment used to be 24 months; it was reduced to 12 months and later to 6 months. (In 1998 a single dose of rifampin, clofazimine and minocycline was recommended, which was abandoned in 2001). Leprosy is a chronic infection, and the bacteria, even after treatment, survive in the Schwann cells of peripheral nerves in many cases, and relapses occur after several months or years.

At times, more bacteria are found in the Schwann cells of peripheral nerves than in the skin. Schwann cells contain the enzyme tyrosine hydroxylase which converts tyrosine to dopa. We have demonstrated that cells like those of adrenal medulla, rich in tyrosine hydroxylase, are earlier sites of *M. Leprae* infection than the skin. Melanocytes which generate trace amounts of dopa, are

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distributed in the skin, eyes etc, where the organisms proliferate; the bacterium utilizes dopa in its metabolism. We have shown that no other mycobacteria possesses *o*-diphenoloxidase. *M. leprae* reaches the liver and spleen by hematogenous distribution much later.

In the enthusiasm by the WHO experts to "eliminate" leprosy, patients who completed the recommended treatment were removed from the register, and they were declared as cured. The follow-up period was reduced to 18 months instead of five years. In multi-bacillary leprosy, the eye is very often involved; but the WHO experts ignore this problem. By these statistical manipulations, the WHO claims to have brought down the number of leprosy patients in the world to less than 3 million. Their aim is 1 patient per 10,000 of the population. But incidence of the disease, especially child rates, has increased. The incidence rate per 10,000 of India in 1995, was around 43; in 2000 it increased to 55; in Brazil 21 to 24. The same is true in east African countries.

Drug resistance in *M. leprae* has been known from the 60s. The bacterium easily acquires resistance to dapsone and rifampin; clofazimine resistance has also been observed in the organisms. The drugs available at present are not completely effective in patients who relapse due to resistant bacteria.

Many drugs are **enzyme inhibitors**. Targeting an essential metabolic activity in an infectious agent for drug development is a **rational approach** to chemotherapy. Mycobacteria produce the enzyme **ß-lactamase**, that hydrolyzes ß-lactam antibiotics; the enzyme protects the organisms against these antibiotics. We demonstrated **derepression** of ß-lactamase in *M. leprae*. ß-lactams induce cell death in bacteria by forming stable acyl enzymes with **PBPs** in the cell membrane. PBPs synthesize **peptidoglycan** of the cell wall; inhibition of PBPs by ß-lactams causes lysis of the bacterial cell.

The introduction of **ß-lactam/ß-lactamase inhibitors** ushered in a new era in the treatment of many bacterial infections. The inhibitors inactivate ß-lactamase and the antibiotic kills the bacteria. Three main types of these drug combinations are available commercially: **Augmentin** (amoxicillin/clavulanate), **Unasyn** or **Sultamicillin** (ampicillin/sulbactam) and **Zocyn** (piperacillin/tazobactam). Augmentin (which was introduced first) has been successfully used to save lives of tuberculosis patients who were resistant to conventional drugs. In our studies, **ampicillin/ sulbactam** showed the **highest activity, three times more than amoxicillin/clavulanate**. In mycobacteria, the enzyme contains serine at its active site. In Gram-negative organisms, zinc-containing ß-lactamase (B type) and synthesis of extended spectrum ß-lactamase (A type) make some bacteria insensitive to these drug complexes. These phenomena are not found in mycobacteria, and the level of ß-lactamase in mycoteria is usually 2000 times less than in Gram-negative bacteria, moreover, ampicillin/sulbactam has a **post-antibiotic effect** about 3 days in mycobacteria. Therefore, less drug used less frequently should be active.

Experimental

The cultivable mycobacteria were grown in 7H9 medium, and *M. tuberculosis* H37Rv in 7H10 medium. The effect of ß-lactam/ß-lactamase inhibitors was tested by measuring turbidity of the cultures, and by the **BACTEC** radiometric method.

M. leprae (which does not grow independently) was purified from the infected tissues (usually spleen) of the **nine-banded armadillo**. The bacteria were disrupted by ultrasonic oscillation. Effect of the drugs was tested on multiplication of *M. leprae* in the **foot pads** of mice.

Results

TABLE 1. β-Lactamase activity of cultivable mycobacteria: absorbance ($\times 10^{-3}$)

Bacteria	Strain	Activity/mg protein
M. tuberculosis H37Ra	25177	171.8
M. bovis BCG	19015	333.3
M. bovis BCG, INH-R	35747	307.8
M. bovis BCG, Str.-R	35748	221.4
M. avium	35712	72.5
M. avium	35713	171.1
M. avium	35714	66.8
M. avium	1102-5	279.1
M. intracellulare	35764	74.4
M. intracellulare	35768	261.5

TABLE 2. β-Lactamase of *M. leprae* correlated with bicillin treatment of the host

Number	Duration of treatment	β-Lactamase
1	14 months	+
2	10 months	+
3	7 months	+
4	6 months	+
5	19 days	—
6	6 days	—
7	4 days	—
8*	Untreated	+
9*	Untreated	+

+, Positive; —, negative.
* Host untreated, but inoculated with bacteria from an animal treated with bicillin.

TABLE 3. Distribution of β-lactamase in *M. leprae*: increase in absorbance, 485 nm (x 10^{-3})

Sample	Absorbance
Cell-free extract of bacteria*	209
Particulate fraction of bacteria	78
Homogenate of uninfected spleen	0
Homogenate of infected lymph node	159

* Bacteria prepared from infected spleen.

TABLE 4. Effect of inhibitors on β-lactamase

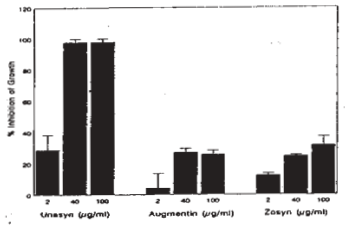
Bacterium	% Inhibition: Sulbactam	Clavulanate
M. leprae	95.1	48.2
M. smegmatis	0*	40.0
E. coli	90.5	96.8

* Initial inhibition completely overcome in 30 min.

TABLE 5. Effect of inhibitors on β-lactamase of cultivable mycobacteria

Bacteria	Strain	Inhibition (%): Clavulanate	Sulbactam	Tazobactam
M. tuberculosis H37Ra	25177	94.2	90.0	93.8
M. bovis BCG	19015	41.9	61.5	76.9
M. avium	35712	93.1	91.4	89.7
M. avium	35714	68.0	68.0	77.0
M. intracellulare	35764	23.8	32.4	33.3
M. intracellulare	35848	24.5	31.6	45.9

FIGURE 1. Suppression of the growth of *M. chelonae* by ß-lactam/ß-lactamase inhibitors.



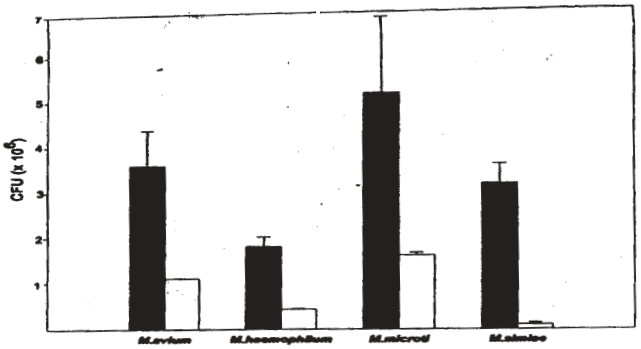


FIGURE 2. Activity of ampicillin/sulbactam (Unasyn®) against mycobacteria multiplying in macrophages. ■, control (untreated); □ 100 mg/l (Unasyn®).

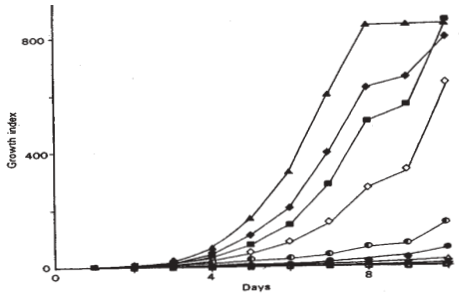


Figure 3. Effect of β-lactam/β-lactamase inhibitors on growth of *M. tuberculosis* H37Rv. BACTEC radiometric assay. ▲, Control 1:1; ●, control 1:100 (MIC); ▼, control 1:1,000 (MBC). Concentration of drug combination (antibiotic concentration) in μg/ml for ampicillin/sulbactam: MIC, 9.38 (6.25); MBC, 18.75 (12.5); ○, 37.5 (25.0); ▽, 18.75 (12.5); □, 9.38 (6.25); △, 4.69 (3.13); ●, 2.34 (1.56); ◇, 1.17 (0.78); ■, 0.59 (0.39); and ◆, 0.29 (0.20).

IC: ampicillin/sulbactam 9.38 μg/ml; amoxicillin/clavulanate 31.25 μg/ml]

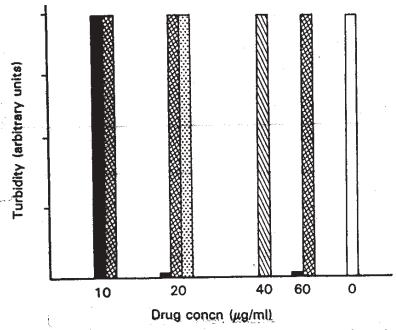


FIGURE 4. Suppression of the growth of *M. tuberculosis* H37Rv-rifampin-resistant strains by β-lactam/β-lactamase-inhibitor combinations. Visual assessment. Open column, control; solid columns, ampicillin + sulbactam; hatched column, ampicillin; stippled column, sulbactam; cross-hatched columns, amoxicillin + clavanulate.

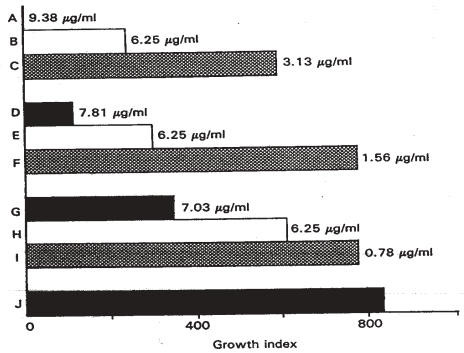


FIGURE 5. Effect of drugs and drug combinations at optimal growth of the bacteria (8 days). (A) ampicillin + sulbactam; (B) ampicillin; (C) sulbactam; (D) amoxicillin + clavulanate; (E) amoxicillin; (F) clavulanate; (G) piperacillin + tazobactam; (H) piperacillin; (I) tazobactam; (J) untreated control. (*M. tuberculosis* H 37 Rv; BACTEC technique)

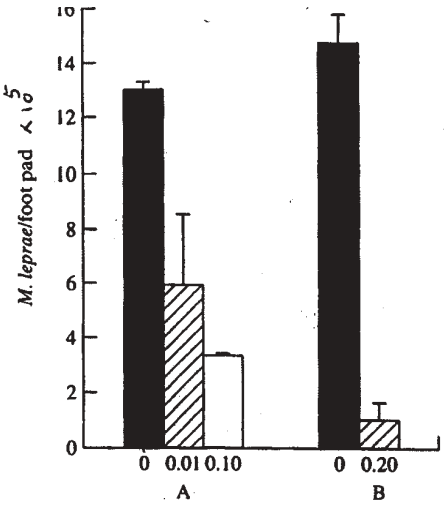


FIGURE 6. Effect of oral ampicillin/sulbactam on growth of *M. leprae* in mouse foot pads, by the 'continuous' method. (A) Littermates of *bg/bg* mice; (B) BALB/c mice. Concentration of drug used: 0.01%, 0.10% and 0.20% in the feed.

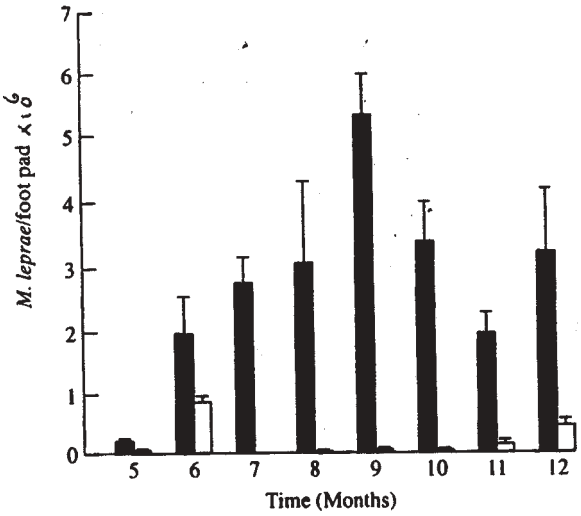


FIGURE 7. Suppression of the growth of *M. leprae* in the foot pads of BALB/c mice by oral ampicillin/sulbactam, by the 'kinetic' method. Concentration of drug used: 0.50% in the feed. ■, control; □, experimental.

Postantibiotic effect of ampicillin/sulbactam against mycobacteria

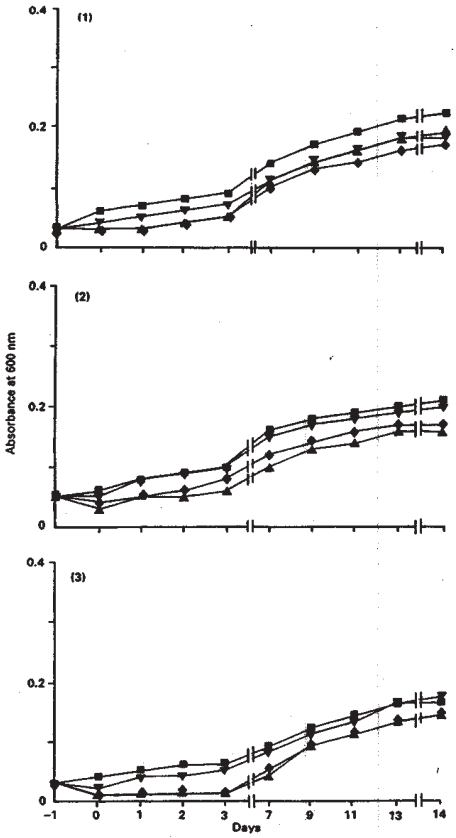


Figure 8. Exposure of (1) *M. avium*, (2) *M. simiae*, and (3) *M. bovis* BCG to the drugs for 24 h. ■, Control; ▼, 10 μg/ml; ●, 60 μg/ml; and ▲, 100 μg/ml.

Conclusions

1. Ampicillin/sulbactam, both injectable (**Unasyn**) and oral (**Sultamicillin**) suppressed the growth of mycobacteria including *M. tuberculosis* in culture, and of *M. leprae* in mouse foot pads. In a collaborative study of ours, the drug was effective against experimental tuberculosis in mice.

2. Ampicillin/sulbactam killed *M. tuberculosis* and *M. leprae* resistant to drugs used currently.

3. Ampicillin/sulbactam should be an effective **rational chemotherapy against drug-resistant tuberculosis and leprosy**, which are on the increase now in many countries.

Acknowledgement

The study was supported in part by Non-Clinical Program for Anti-Infectives, **Pfizer Pharmaceutical Group**, Pfizer Inc, NY, USA.

★

Table 4. Properties of Cocci grown on BHI Agasr Medium

ph	5.5	7.0	8.5		
	+	+++	++		
Temperature (ph 6.6-6.8 after 48 hrs)	28°C	37°C	42°C	44°C	
	++	+++	++	+	
Growth with NaCL	0.5%	10.0%	12.5%	15.0%	17.5% 20.0%
(ph 6.6-6.8 after 48 hrs)	+++	++	++	++	+ +
Catalase	+				

Table 5. Culture Characteristics for Distinguishing the *Cocci* from STAPHYLOCOCCI and ENTEROCOCCI on the Media.

	Incubation Conditions	Results
DNA agar (DNAse agar)	37°C, Aerobic, 24 hrs.	Growth but no zone after addition of IN HC1 = DNAse negative
EF agar (Nissui)	37°C, Aerobic, 24 hrs.	No growth
MacConkey agar (Eiken)	37°C, Aerobic, 24 hrs.	No growth
Vogel-Johnson aga (Difco)	37°C, Aerobic, 24 hrs.	Growth but no yellow zone around colonies

Table 6. Incubation Procedure for the Observation of Cyto-morphorlogical Changes of the *Cocci* at the level of Microscopic Appearance.

Shaking culture in BHI Liquid medium at 37°C for 24 hrs. in air

|

To be collected and washed in 0.1% sterile Glycerol solution

|

The sediment to be suspended in *No. 147* medium and incubated statically at 37°C for *5 - 10 weeks* in air

No. 147 Med. (Nitrogen source free)

Potassium phosphate, dibasic	0.25 g
D-Mannitol	10.0 g
Sodium chloride	5.0 g
Potassium chloride	0.5 g
Glycerol	60.0 ml
Distilled water	1,000.0 ml

ph 7.0 ± 0.2

|

After 5 - 10 weeks ….

|

To be collected and washed in 0.1% Glycerol solution

|

The sediment to re-suspended in 0.1% Glycerol solution

|

To be inoculated 0.5 ml of re-suspended specimen into a culture tube of *No. 138* medium

No. 138 Med.

Asparagin (e)	4.0 g
Potassium phosphate, monobasic	1.25 g
Potassium phosphate, dibasic	0.9 g
Sodium citrate	2.5 g
Magnesium sulfate	0.5 g
- Ferric Ammonium citrate	0.05 g
Gelatin	30.0 g
Glycerol	60.0 ml
Agar	17.5 g
Distilled water	1,000.0 ml

ph 7.0 ± 0.2

|

To be spread over the inoculum evenly on whole surface of the medium

|

The inoculated slants to be kept in the incubator at 37°C, up to *10* weeks

. . . . . Microscopic Observation . . . . . .

Smears to be made sometimes, from the surface of the medium and stained by Ziehl-Neelsen Method.

Fig. 1. Colonies of Gram-positive non-acid-fast *Cocci* from HD patient specimen (skin smear) on BHI agar. (Original x6.7)

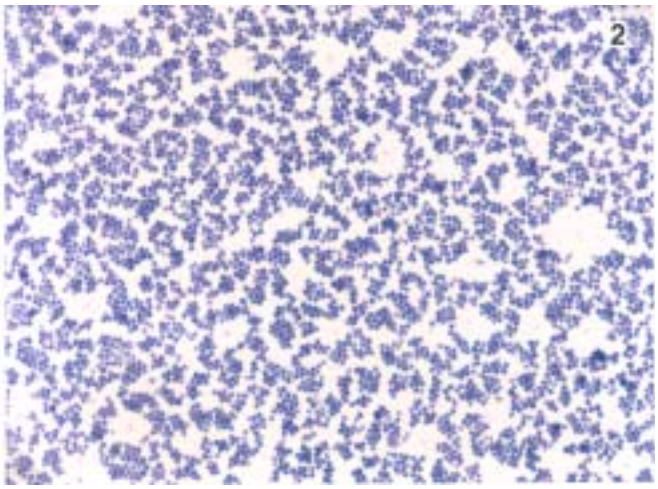


Fig. 2. Cultivated Gram-positive non-acid-fast *coccoid organism* on BHI agar. (Ziehl-Neelsen stain)

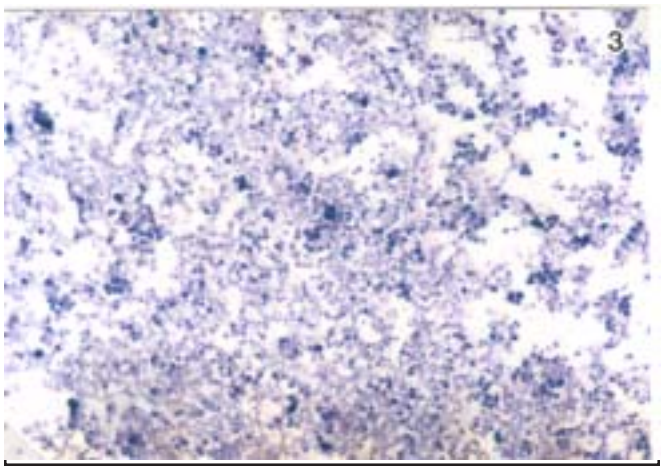


Fig. 3. *Coccoid organisms* with cellular debris-like complex in No. 147 medium. (Ziehl-Neelsen stain)

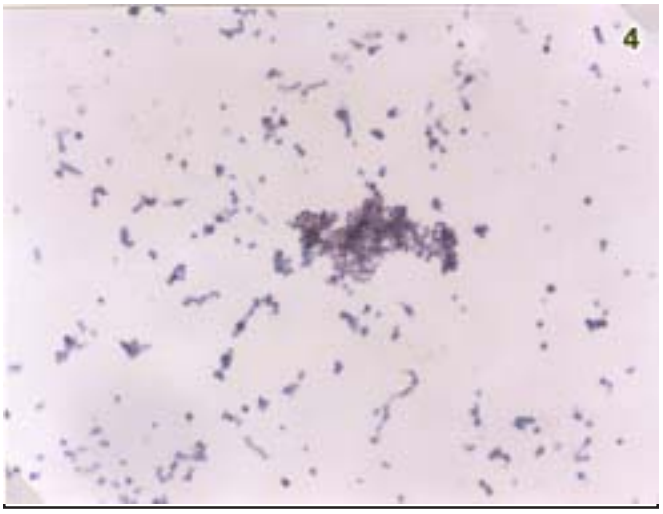


Fig. 4. Unclear spherical forms of *coccoid organisms* in No. 147 medium. (Ziehl-Neelsen stain)

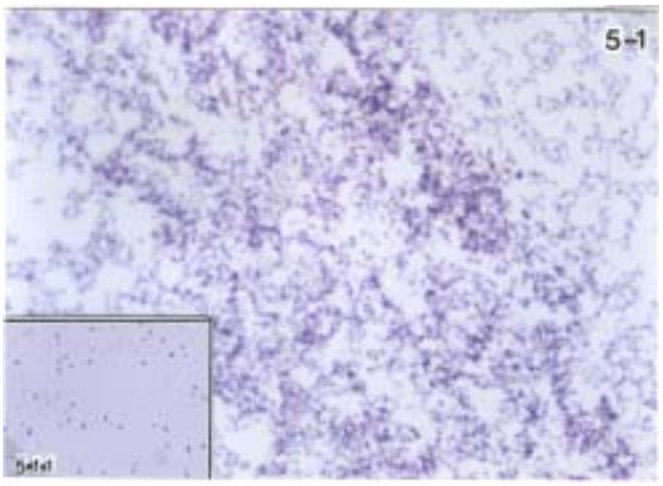


Fig. 5-1. Ziehl-Neelsen stain showing diversity of light purple tints organisms on No. 138 agar after 8-10 weeks incubation at 37°C. (Fig. 5-1-1: small granular forms of the organisms)

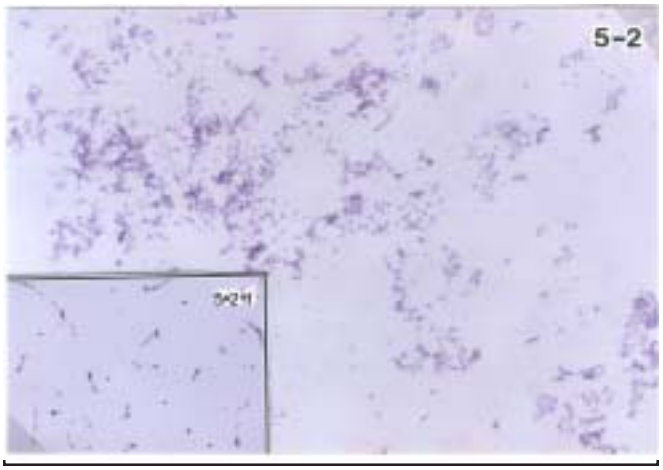


Fig. 5-2. Ziehl-Neelsen stain showing diversity of light purple tints organisms on No. 138 agar after 8-10 weeks incubation at 37°C. (Fig. 5-2-1: slim-tiny rod-like forms of the organisms)

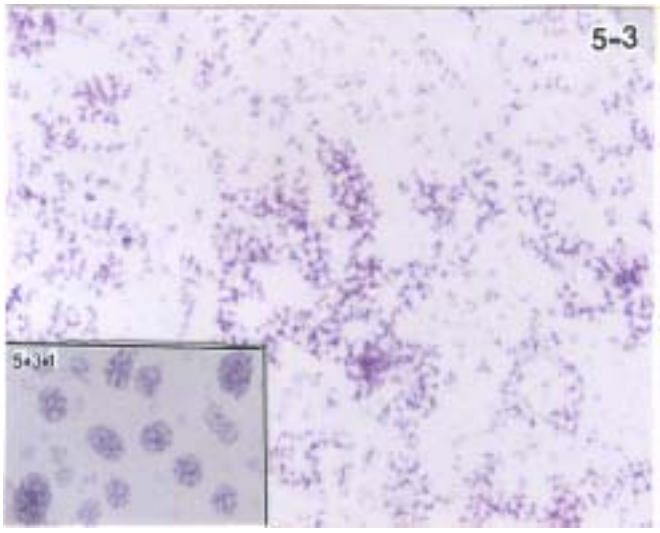


Fig. 5-3. Zeihl-Needlsen stain showing diversity of light purple tinted organisms on No. 138 agar after 8-10 weeks incubation at 37°C. (Fig. 5-3-1: some of materials without substance)

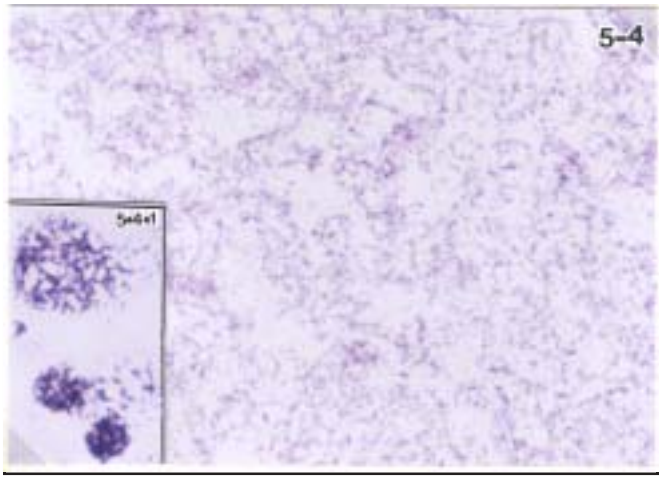


Fig. 5-4. Ziehl- Neelsen stain showing diversity of light purple tinted organisms on No. 138 agar after 8-10 weeks incubation at 37°C. (Fig. 5-4-1: some of the materials looked like loose balls of knitting wool)

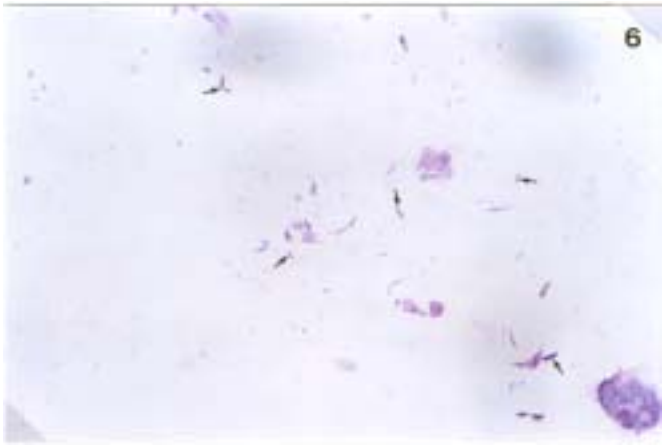


Fig. 6. Rod-like forms observed in left hind foot pad of nude mouse. (Arrows show rod-like forms)

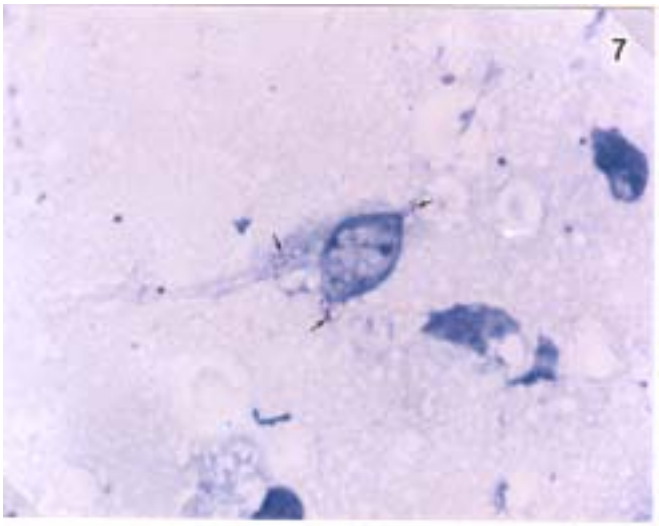


Fig. 7. Small granular forms in histiocyte-like cell observed in left hind foot pad of BALB/C mouse. (Arrows show granular forms)

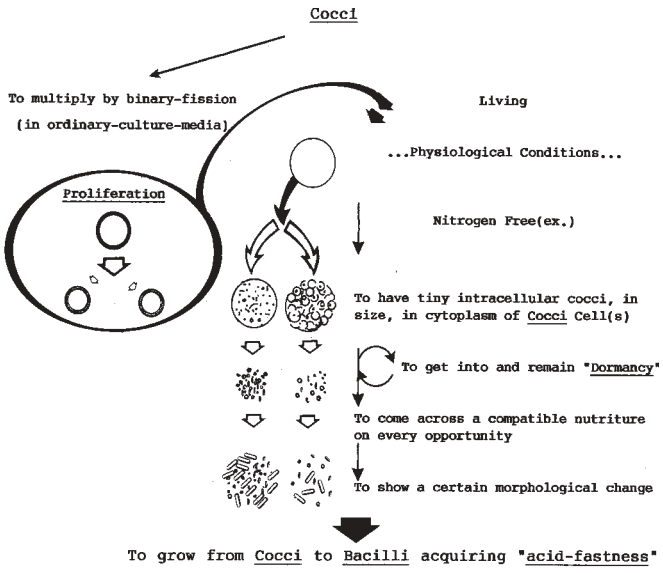


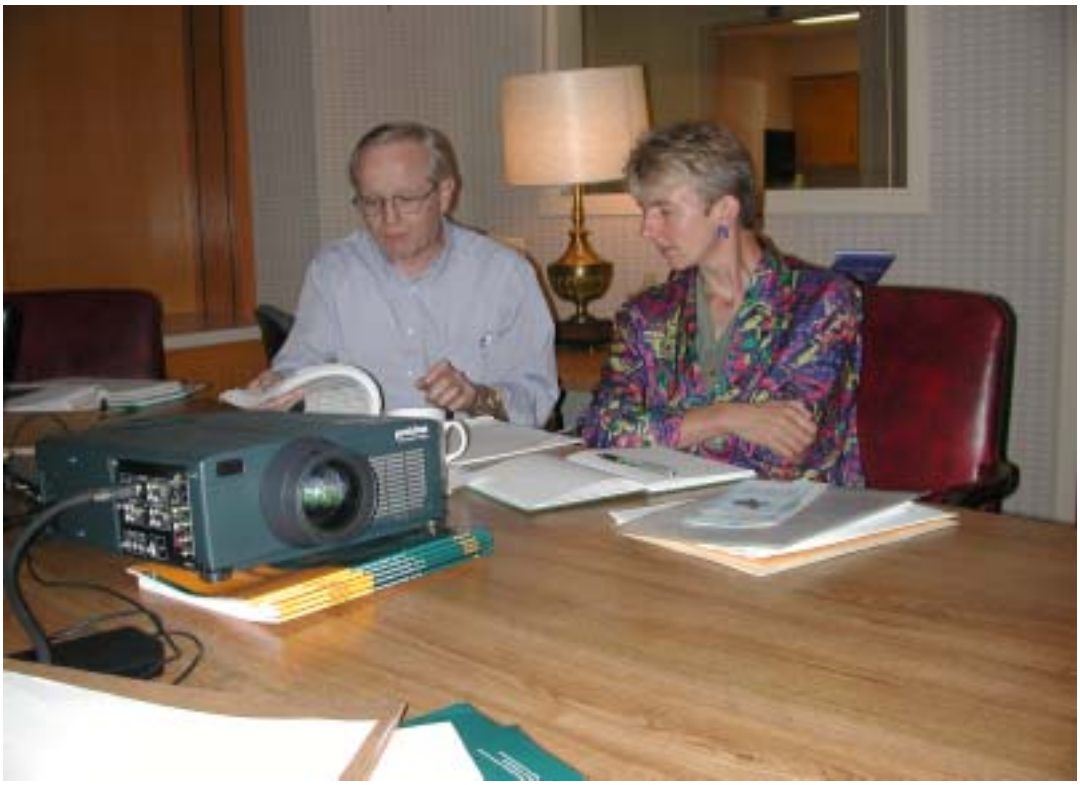
Fig. 8. Diagram showing Intracellular Morphological Changes of Coccoid Cell(s) turning toward tiny-slender Bacillary form(s).

Continued on page 4: References

VISITORS

Medical Missionaries of Mary visits **The STAR**. Dr., Sr. Margaret Anne Meyer, MMM physician missionary from Ogoja, Nigeria, West Africa where she works in Hansen's disease. Pictured with **The STAR** editor Emanuel Faria at Carville, Louisiana.

Sr Margaret Anne Meyers at the Summit Hospital in Baton Rouge, Louisiana.



Dr. Diana Lockwood, Chief Leprologist UK and editor of ***Leprosy Review*** compare notes with ***International Journal of Leprosy*** editor Dr. David Scollard.

Photos by Tanya Thomassie

Obituary:

Dr. Paul Wilson Brand, world renown leprologist, surgeon, writer and teacher, died 8 July 2003.

Dr. Brand had retired in August 1986, as Chief of the Rehabilitation Branch at the United States Public Health Service Hansen's Disease Center in Carville, Louisiana, USA. Surgeon General C Everett Koop presented Dr Brand with the U S Surgeon General's Medallion, "for his skill and compassion which have restored and revived the hopes of seriously disabled persons." It was one of many honors and awards the world-renowned orthopedic surgeon and author had earned for his work in the sphere of the physical rehabilitation of Hansen's disease patients. He also received the Albert Lasker Award, "for outstanding leadership and service in the field of rehabilitation." He was awarded the Hunterian Professor of the Royal College of Surgeons and later honored with the title of Commander of the Order of the British Empire (OBE) by Her Majesty Queen Elizabeth II of England.

Drs. Paul and wife Margaret Brand were joint recipients of the Damien-Dutton Award in recognition of "outstanding contributions in prevention and correction of disabilities due to leprosy." In a letter of congratulation to the Brands, former U.S. President Jimmie Carter said, "It is most fitting that you have been named recipients of the Damien-Dutton Award in recognition of your remarkable accomplishments and humane efforts on behalf of thousands of victims of Hansen's disease. Your deep-rooted concern for human dignity and your dedication and compassion exemplify the finest tradition of your profession and that of the United States Public Health Service."

At the United States Public Health Service Hansen's Disease Center in Carville, Louisiana, Dr. Brand began the first rehabilitation research program for Hansen's disease patients. Studies began in the biomechanics of deformity of hands and feet. The development of amputation prevention footcare techniques began and continue today to apply to diabetes and other diseases. These measuring, healing, prevention techniques, teaching and reconstructive surgery of hands and feet are ongoing, applying Dr. Brand's methodology.

Dr. Brand initiated the 'Team Approach' concept in the field of rehabilitation. The 'Team approach' was a unique concept of patient, surgeon, engineer and therapist, each being and equal partner in a team solving rehabilitation effort. Dr. Brand's vision of a team approach to solving problems and focusing on the patient as a participant in this team was the concept that launched a certified hand therapy specialty and contributed significantly to the development of a certified pedorthics specialty. Under Dr. Brand's direction and enthusiasm, the team attained a position of leadership in the field of deformity correction and restoration of limb function. His deliberate encouragement of staff to be involved at this level has produced a well trained cadre of individuals who have, in turn, continue to train others in the methodology of Dr. Brand.

He was the author of over 100 scientific papers and seven books, including Clinical Mechanics of the Hand (1985), which is the leading handbook for hand surgeons, Physiotherapists and other hand specialists.

Dr. Brand began a rehabilitation research demonstration project "to study the cause, consequences and management of altered sensation in the hands and feet of patients with a variety of other disorder characterized by a loss of sensation or excessive sensitivity to pain," and "to develop techniques and guideline which will assist in the employment of the neurologically handicapped, particularly those disabled by altered sensation as in Hansen's disease, diabetes, rheumatoid arthritis and stroke." This program continues today with Dr. Brand's vision of patients, engineers, surgeons and other speciality professions working together as a 'team approach' to solve rehabilitation problems. The 'team approach' continues to grow, not only in the directions he started, but in new directions as well. The staff at the National Hansen's Disease Programs Rehabilitation, Research and Training Branch continue to network with the national and international community in the treatment, reconstructive surgery, rehabilitation and training of Hansen's disease. Dr. Brand's work lives through his dedication and encouragement to others. His skills, talents, spirit and humble humanity has made life worth living for all that knew him through service to his fellow man. A truly remarkable man, gifted and inspired beyond belief. He visualized a better and healthier world for all people and constantly worked towards this goal. Dr. Brand once stated, "a single dedicated person giving a good example is better than a lot of wringing of hands and prophecies of doom." *No one knows who has suffered a greater loss; those of us who knew him, or those of you who did not.*

Dr. Brand will be missed not only by his former professional colleagues, but by patients who's lives he touched with his humanitarian concern for and understanding of human needs.

Dr. Paul Brand was a servant of God, called to serve the less fortunate, the sick and the disenfranchised, which he faithfully did with all his heart, mind and spirit.

A great master of life and medicine.

SOURCES OF HD TREATMENT IN THE UNITED STATES

THE NATIONAL HANSEN'S DISEASE PROGRAMS (NHDP) provides HD care to persons in the United States at 1770 Physicians Park Drive, Baton Rouge, LA 70816 and through the Ambulatory Care Program, which includes the following Outpatient HD Clinics:

NATIONAL AMBULATORY HANSEN'S DISEASE PROGRAM

AREA	FACILITY	ADDRESS	PHYS/NURSE	APPOINTMENT
BOSTON	Lahey Medical Center	41 Mall Rd. Burlington, MA 01805	Samuel Moschella, MD Stephanie Burns, RN	781-744-5670
CALIFORNIA LOS ANGELES	LAC, USCMedical Center Attn: Section of Dermatology Room 8440	1200 North State St. Los Angeles, CA 90033	Thomas Rea, MD Helen Mora, RN	323-226-5240
MARTINEZ	Contra Costa Regional Medical Center Outpatient Clinic	2500 Alhambra Drive Martinez, CA 94553	Sutherland/Saffier, MDs Carol James, RN	925-370-5270 1-800-495-8885 (In state only)
SAN DIEGO	North San Diego Health Center	2440 Grand Avenue San Diego, CA 92109	D. A. Lopez, MD Carmen Rodriguez, RN	858-581-4300
CHICAGO	University of Illinois College of Medicine	Department of Dermatology, (MC 624) 808 S. Wood Street, RM 376 CME Chicago, IL 60612	Carlotta Hill, MD Norma Chelseth, RN	312-996-0734
MIAMI	Jackson Memorial Hospital	Ambulatory Care Center 1611 N.W. 12th Avenue Miami, FL 33136	Anne Burdick, MD Gloria Ingle, RN	305-585-2600
NEW YORK	Bellevue Hospital Center Department of Dermatology Room 17-N-7	462 First Avenue New York, NY 10016	William Levis, MD Aloys Cabrera, RN Louis Iannuzzi, PT, C.Ped	212-562-6096
PHOENIX	Maricopa County Health Dept.	1825 East Roosevelt Street Phoenix, AZ 85006	Ronald Pust, MD Bill Cooper, RN	602-372-6661
PUERTO RICO	University of Puerto Rico Medical School	Department of Dermatology P. O. Box 365067 San Juan, PR 00936-5067	Pablo Almodovar, MD Sonia Santos-Exposito, RN	787-765-7950
SEATTLE	Harborview Medical Center	2 West Clinic - 359930 325 9th Avenue Seattle, WA 98104	James P. Harnisch, MD Rebecca Finch, RN Tom McClure, PT, CH	206-731-5100
TEXAS DALLAS	Texas Dept. of Health	2377 N. Stemmons Freeway, Ste. 5 Dallas, TX 75207-2710	Carolyn Lyde, MD Nancy Bernstein, RN	214-819-2010
HOUSTON	Houston Health & Human Services Dept.	3901 Westheimer, Suite 200 Houston, TX 77027	Terry Williams, MD Doris Gay, RN	713-284-9609
SAN ANTONIO	Texas Center for Infectious Disease	2303 S. E. Military Drive San Antonio, TX 78223	Robert N. Longfield, MD Therese M. Shoffner, RN	210-531-4554
HARLINGEN	South Texas Health Care Center OPCL	1301 Rangerville Road Harlingen, TX 78550	Richard Wing, MD San Juana Thompson, RN	956-423-3420 ext. 351

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FACTS ABOUT HANSEN'S DISEASE

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What is (HD)?

Hansen's disease, erroneously associated with biblical leprosy, is a complex infectious disease which, although recognized for more than two thousand years and found to be caused by a bacterium over a century ago, is not completely understood. Dr Gerhard Armauer Hansen, Norwegian scientist, first discovered the HD bacillus in 1873. Considerable progress has been made during the last 40 years, so that today we can treat the majority of cases without undue difficulty and counteract most of the fears generated by the folklore surrounding this disease.

HD is essentially a disease of the peripheral nerves, but it also affects the skin and sometimes other tissues, notably the eye, the mucosa of the upper respiratory tract, muscles, bones and testes.

There are both localized and disseminated forms of HD. If left untreated, HD causes nerve damage, which can result in loss of muscle control and crippling of hands and feet. Eye involvement can result in blindness.

Where is HD Found

In 1994 the World Health Organization estimated that there were 2.4 million cases of HD worldwide with 1.7 million cases registered on treatment. The estimates for 1985 were 10 – 12 million and 5.4 million respectively. According to these estimates, in 1994, 70% of those who should be on treatment are now being treated. In 1992 there were 690,000 new cases reported and in 1993, 591,000 cases. There are also an estimated 2 – 3 million cases who have completed treatment but who still have residual disabilities who are not included in the above 1994 totals. The largest numbers of Hansen's disease patients continue to be in Southeast Asia and Central Africa with smaller numbers in South and Central America. The largest number of patients in the Western Hemisphere are in Brazil.

In the United States there are approximately 6,500 cases on the registry which includes all cases reported since the registry began and still living. The number of cases with active disease and requiring drug treatment is approximately 600. There are 200 – 250 new cases reported to the registry annually with about 175 of these being new cases diagnosed for the first time. The largest number of cases in the US are in California, Texas, Hawaii, Louisiana, Florida, New York, and Puerto Rico. There are still approximately 150 cases at the Gillis W Long Hansen's Disease Center at Carville, LA, the only institution in the US exclusively devoted to Hansen's disease. The center functions as a referral and consulting center with related research and training activities. Most patients in the US are treated under US Public Health Service grants at clinics in major cities or by private physicians. (See inside back page for listing of clinics.)

How Does HD Spread?

While this aspect of the disease remains a medical mystery, the most commonly accepted theory is that it is transmitted by way of the respiratory tract, and abraded skin. The degree of susceptibility of the person, the extent of exposure, and environmental conditions are among factors probably of great importance in transmission. Most specialists agree that 90% or more of the world's population have a natural immunity to the disease. Persons working with HD contract the disease only rarely. Cases of HD which respond satisfactorily to treatment become noninfectious within a short time.

How is HD Treated?

Although the sulfone drugs, introduced at Carville in 1941, continue to be an important weapon against the Hansen bacillus the rising incidence of sulfone resistant disease necessitates treating all patients with more than one drug. Usually rifampin and sometimes clofazimine or ethionamide are given in addition to dapsone. Treatment rapidly renders the disease noncommunicable by killing nearly all the bacilli and these dead bacilli are then cleared from the body within a variable number of years.

Gillis W Long Center

GET TO KNOW THE FORTY & EIGHT

The Forty & Eight, an honor society of legionnaires created in 1920 and *The Star's* primary funding organization, draws its origin from World War I. Millions of American soldiers in France were transported to the front in narrow French box-cars, called "Voitures," which would only hold 40 men or 8 horses. Remembering the close brotherhood of those box-car days, La Societe des Quarante Hommes et Huit Chevaux (The Society of 40 men and 8 Horses) was formed and local Voitures began organizing as outstanding Legionnaires were invited into membership. Membership is still by invitation only.

Dedicated to the needs of their fellowman, the Forty & Eight raises funds and support not only ***The Star,*** but funds a national nursing scholarship program, various child welfare programs, provides aid to veterans and continues to promote Americanism at both local and national levels.