

Congress Exhibits

The nine-banded armadillo (*Dasypus novemcinctus*), a laboratory model for studying lepromatous leprosy. *C. H. Binford*, Armed Forces Institute of Pathology, Washington, D.C.; and *E. E. Storrs*, Gulf South Research Institute, New Iberia, Louisiana.

Dr. Eleanor E. Storrs, Ph.D., biochemist, New Iberia, Louisiana, assisted by Waldemar F. Kirchheimer, Ph.D., microbiologist at the USPHS Hospital, Carville, Louisiana, on 10 February 1970, initiated a program for use of the armadillo in leprosy research. The exhibit by color photomicrographs will depict the success that has been obtained at the Gulf South Research Institute in this animal. The pictures are selected from tissues obtained at autopsy of seven animals. The exhibit emphasizes the similarity of leprosy in the armadillo to human lepromatous leprosy. The summary of the results to date with this new animal model shows that it offers great promise for basic research in lepromatous leprosy.

Ultrastructural changes in peripheral nerves in leprosy. *Janny Boddington*, *Graham Weddell* and *R. J. W. Rees*, Department of Human Anatomy, Oxford and National Institute for Medical Research, London.

In this exhibition, pathologic changes are shown in the sciatic nerves of mice 2-1/2 years after infection with leprosy, and in radial and superficial peroneal nerves of patients with different forms of leprosy.

The photographs displayed were taken at different magnifications (10X to 210,000X). They depict a) the gross anatomy of the mouse sciatic nerve, b) semithin transverse Araldite sections, and 5 μ paraffin sections, seen by light microscopy, and c) ultrathin transverse sections, seen by electron microscopy. Special attention has been given to the perineurium and to the endothelium of endoneurial blood capillaries, and to their barrier capacities. Defects in the "blood-nerve barrier" in leprosy are also shown.

The display consists of ten wall charts (Nos. I-X):

I. Mouse sciatic nerve *in situ*, consisting of tibial, common peroneal and sural nerves. Semithin Araldite section showing the various nerve tissue components.

II. Mouse sciatic nerve (proximal): montage of semithin sections. Normal structure.

III. Mouse sciatic nerve (distal): montage of semithin sections. Abnormal structure of tissue components in borderline-lepromatous leprosy.

IV. Mouse sciatic nerve. Ultrathin transverse sections. Normal structure of nerve fibers, of perineurium (including demonstrations of barrier capacities), and of endothelium of endoneurial capillaries (including demonstrations of barrier capacities), and of endothelium of endoneurial capillaries (including demonstrations of barrier capacities).

V. Mouse sciatic nerve (borderline-lepromatous leprosy). Ultrathin transverse sections. Abnormal structure: *M. leprae* in blood vessel lumen, in lysosomes of macrophages, in Schwann cells and in axons.

VI. Comparison of pathologic changes in the perineurium of nerves in men and mice with leprosy.

VII. Comparison of pathologic changes in the endothelium of endoneurial blood capillaries in men and mice with leprosy.

VIII. Mouse sciatic nerve (lepromatous leprosy). Defects in the "blood-nerve barrier" of endoneurial capillaries.

IX. Human nerve in tuberculoid, borderline and lepromatous leprosy (by light and electron microscopy).

X. The occurrence of *M. leprae* in axons of the superficial peroneal nerve in a lepromatous patient.

B663: clofazimine; Lamprene; electron microscope studies. *Colin McDougall*, Department of Human Anatomy, Oxford, England.

In order to investigate the mode of accumulation of B663 in the cytoplasm of cells, Parkes albino mice were fed on 0.01% of this drug in their diet, continuously for a period of ten months. They were changed to a normal diet for six months before killing, and tissues were then examined by

electron microscopy. Accumulations of the drug in the cytoplasm of cells in mouse spleen are shown in this exhibit, and a dual phenomenon is revealed: 1) crystal-spaces representing the site of drug crystals, but dissolved out during EM processing, 2) osmophilic rods or bands closely associated with these crystal-spaces, and often alternating with them, or lying in close relationship. High magnification pictures of these showed crystal planes running approximately perpendicular to the long axes of the rods, and optical diffraction revealed spacings varying between 33 and 42 Å. Although unproven in this study so far, it is thought possible that the osmophilic rods could represent a crystalline array of B663 with some other molecule, possibly a lipoprotein.

The findings generally are in keeping with previous conclusions of Barry, Conalty and colleagues in Dublin, 1957-72. Membranes have been demonstrated around crystal-spaces, and around some osmophilic rods, and lend support to the theory that B663 enters the lysosomal-vacuolar system, bound to a serum-protein carrier, later to crystallize in secondary lysosomes.

The relationship between intracellular location and viability of *Mycobacterium leprae* in treated and untreated patients. *Rosa P. Edwards*, Department of Human Anatomy, Oxford, England.

First wall chart. The morphologic details of the bacillus are shown in dividing and nondividing stages, also the relationships of viable and nonviable forms to lysosomes and phagolysosomes and their membranes.

Second wall chart. Four stages in the process of degeneration are shown and the relationship of the bacilli to phagolysosomal complexes within phagocytic cells in treated and untreated patients; with special reference to long-spaced collagen, which is a noteworthy feature in the skin biopsy after six weeks treatment with rifampicin.

Third wall chart. The location of viable and nonviable bacilli in process of division is shown; also that of bacilli with, and without, enclosing membranes within phagocytic cells and the breakdown of other such cells, with the subsequent release of bacilli into the surrounding environment.

Three-dimensional observation of human and murine leprosy lesions by freeze etching technic. *Mitsugu Nishiura*, Leprosy Research Laboratory, Kyoto University, Japan.

Freeze etching technic which is one of the recent advancements of electron microscopy enabled us to study the three-dimensional ultrastructures of human and murine leprosy lesions.

For this study a new type of freeze etching apparatus was made in our laboratory. Small chips of human and murine lepromas were frozen in liquid Freon or in liquid nitrogen. These frozen tissues were fractured in the vacuum and later the cleavage surfaces of the tissues were replicated with platinum and carbon, after one minute of etching at -100°C . In the freeze fracture technic, the cleavage surface was replicated directly after fracturing at -160°C . Replica films collected after the removal of the tissues were examined with the electron microscope.

Striking difference was found in the peri-bacillary structures of human and murine leprosy bacilli by this technic. The intracytoplasmic foamy structures of human lepra cells are usually surrounded with a single membrane derived from the membrane of phagocytic vacuole. Human leprosy bacilli are found naked in these foamy structures. No particular membranous structures are seen outside the cell wall of the human leprosy bacilli. Single separate bacilli in the cytoplasm are sometimes surrounded directly with a single membrane of phagocytic vacuoles. On the contrary, murine leprosy is usually surrounded by multilayered thin membranous structures of crystalline nature. Also thin rectangular prism-shaped crystals are seen outside the cell body of murine leprosy bacilli. No foamy structures can be seen in the cytoplasm of murine lepra cells.

Mechanisms of nerve damage in leprosy. *J. Pearson and G. Weddell*, Department of Human Anatomy, Oxford, England.

The clinical and histopathologic features of untreated leprosy depend largely on the immune response of the host to the presence of *M. leprae*, and the much varied findings reflect the wide range of responses which can be elicited by this pathogen. In

patients undergoing treatment "reactions" commonly develop and complicate the features of resolving leprosy.

The peripheral and dermal nerves are liable to be damaged both in active leprosy and in reactions, but there are a number of different mechanisms involved. This demonstration illustrates four of them.

1. In tuberculoid leprosy there is a powerful immune response to the presence of bacilli within Schwann cells; in the course of this response the nerve is destroyed and replaced by epithelioid granuloma.

2. In lepromatous leprosy infection of the perineurial cells triggers a complex sequence of events, in which attempts to repair the damage can ultimately destroy the nerve.

3. In reversal reactions acute edema can compress the already damaged nerves.

4. *Erythema nodosum leprosum* (ENL) foci of tissue damage occur at the sites of deposition of toxic immune complexes.

The nose in leprosy. R. J. W. Rees, Frank Davey, Rex Barton, Colin McDougal and A. G. M. Wedell, National Institute for Medical Research, London; Victoria Hospital, Dichpalli, India; ENT Department, St. Mary's Hospital, London; and Department of Human Anatomy, Oxford.

The demonstration illustrates the involvement of the nose in both experimental animals and in man.

We conclude from our studies: 1) that in animals and man the nose is a site of predilection for the multiplication of *M. leprae* and their discharge to the exterior; 2) the nose, in contrast to the skin, is the main site from which bacilli are discharged to the exterior; 3) *M. leprae* in dried nasal discharges remain viable outside the body for nearly two days; 4) the number of leprosy bacilli in nasal discharges is similar to those of *M. tuberculosis*; 5) nasal infection with the discharge of large numbers of *M. leprae* is a feature of nearly all patients with active lepromatous leprosy and the nasal infection can be more severe than judged from the patient's clinical appearance.

Evidence in support of these conclusions is presented in the demonstration.

"Armauer Hansen; Discoverer of the Leprosy Bacillus."

A documentary film is produced on Ar-

mauer Hansen's discovery of the leprosy bacillus. You will follow Armauer Hansen in his fight against prejudice within as well as outside the medical profession. The film is shot in authentic interiors and exteriors and will give an evocative impression of Armauer Hansen's work and life.

The film will be on sale from autumn 1973. For further information please contact: SVEKON FILM, Seiersbjerget 7, N-5000 Bergen, Norway.

The National Leprosy Registry of Norway.

The Leprosy Registry was founded in 1856 and is probably the first national patient registry ever to be founded. Through the collection of detailed case histories on all leprosy patients from the year 1856 until today, the registry has played a significant role in the control of the disease. Analyses of the registry material made possible the evaluation of trends in prevalence, and thus plans for medical care and for any changes in the control program that proved necessary from time to time.

From an epidemiologic point of view, the registry material, covering a period of more than one hundred years of epidemicity and subsequent control of the disease, appears to be unique. This material has not earlier been used in a complete analysis of the epidemiology of the disease in Norway. The data are now being worked up by EDP-methods.

System of registration and practical management of the Leprosy Registry are accounted for in the exhibition stand.

All-Africa Leprosy and Rehabilitation Training Centre, Addis Ababa.

The purpose of ALERT is to provide training in the fields of leprosy control, treatment and rehabilitation, for senior personnel.

The headquarters of the organization are at the Princess Zenebework Memorial Hospital, Addis Ababa, Ethiopia, and its area of operations includes the whole of Shoa Province where nearly 10,000 patients are under treatment.

The Armauer Hansen Research Institute is an integral part of ALERT and is primarily concerned with basic research in the immunology of leprosy.

ALERT is supported financially and with

seconded personnel by the Imperial Ethiopian Government, and the following international and national agencies:

American Leprosy Missions, Inc.
The Leprosy Mission, London
American Presbyterian Church
Church Missionary Society
Emmaus Suisse
German Leprosy Relief Association
Netherlands Technical Assistance
Office Belge de Cooperation au Develop-
ment
Redd Barna, Norway
SIDA, Sweden
Swedish Red Cross
Swedish Save the Children Federation
We Help, Sweden
Medical Research Council, London
Amici dei Lebbrosi, Italy
Bread for the World, Germany
Les Amis du Pere Damien, Belgium
Raoul Follereau Foundation, Canada
Raoul Follereau Foundation, Luxembourg
SIMAVI, Netherlands
Through the World Council of Churches:
Anglican Church of Canada
British Council of Churches
Church of Denmark ICA Federation
Christian Aid, London
Finnish National Committee of the Luth-
eran World Federation
Lutherhjälpen, Sweden
Methodist Appeal, London

The exhibition outlines the research and training activities of ALERT, and the leprosy control and hospital facilities within which the training takes place.

The INTERNATIONAL JOURNAL OF LEPROSY. Forty years of reporting progress in the study, treatment and care of leprosy. *Hella Meivers*, Armed Forces Institute of Pathology, Washington, D.C.

An exhibit honoring Dr. Gerhard Armauer Hansen for demonstrating the bacillus causing leprosy emphasized the contributions of the INTERNATIONAL JOURNAL OF LEPROSY in its forty years of reporting progress in the treatment, care and research of this disease.

The exhibit displays a nearly life-size photograph of the forty volumes that have been published and the five valuable supplements supplied in recent years. Those

were: LWM-AFIP Conference—Research Problems in Leprosy, 1965; History of the Leonard Wood Memorial—Forty Years of Leprosy Research, 1967; Symposium on Sulfones—United States-Japan Cooperative Medical Science Program, 1967; Transactions of the Ninth International Leprosy Congress, 1968; Leprosy Today—International Leprosy Colloquium Forschungsinstitut Borstel, Borstel, Germany, 1971.

The exhibit concludes by featuring the current articles on the armadillo in leprosy research that have been published in the INTERNATIONAL JOURNAL OF LEPROSY. The IJL goes to 532 members and 405 subscribers throughout the world.

A history of leprosy in postage stamps. *S. R. Wood*, Worcester, England.

Leprosy has been documented since the pre-Christian era, reaching Europe from the Mediterranean with maximum incidence in the 14th century, and many medieval Christian orders were established to care for sufferers. Declining in Europe generally after the 16th century, it spread to the New World and to the Pacific, where it claimed many victims, especially among missionaries. In West Norway it continued to flourish largely due to poverty and overcrowding and its prevalence here led naturally to an intensive study of the disease in the 19th century, culminating in Hansen's discovery of its cause, and later in valuable confirmatory work by German pathologists. Administrative measures then resulted in the disease dying out. In recent times case finding methods, combined with the development of modern domiciliary chemotherapeutic treatment and supported by continual research are helping the authorities in many tropical countries to emulate Norway's fight against the disease a century ago. These points are illustrated by a relevant selection of postage stamps of the world.

The Bergen collections on the history of medicine.

This only museum of the history of medicine in Norway was established in 1972 as a foundation attached to the University of Bergen, and consists of the Armauer Hansen Commemorative Rooms.

the Leprosy Museum and the Museum of the History of Medicine.

The Armauer Hansen Commemorative Rooms were opened in 1962 in the earlier Pleiestiftelsen for Spedalske no. 1 (Leprosarium No. 1). This hospital was closed in 1957 and the premises were taken over by a rehabilitation institute. To honor the memory of Armauer Hansen all objects connected with him were preserved and placed in the Armauer Hansen Commemorative Rooms.

The Leprosy Museum was opened in 1970 in St. Jørgen's Hospital, which can be traced back in history to 1411. Parts of the hospital as it now stands date back to 1702, making it the oldest existing hospital in Scandinavia. The Armauer Hansen Commemorative Rooms and the Leprosy Museum will be open every day from 1200 hours to 1800 hours.

Wet and in the Darkness. In Spanish. *Celia Ana Justina Vazquez de Bernard.*

Wet and in the Darkness, is an Argentine novel in which the writer tries to open a new area of knowledge of Hansen's disease. The author describes how the prejudice of "leper" involves a family, a town, its schools, authorities and institutions. Health education returns the patients to a productive and useful status in society.

The book is written very simply for didactic purposes, and accessible to everybody. However, the most advanced medical, social and epidemiologic concepts about this disease are included in it. This work was well received by the Argentine Leprosy Association.

Publishing houses.

Edw. Arnold (Publisher) Ltd. (Woodlands Park Avenue, Maidenhead, Berks.); Blackwell Scientific Publ., Ltd. (Osney Mead, Oxford OX2, OEL); Churchill Livingstone (23 Ravelston Terrace, Edinburgh EH4, 3TL); Gustav Fischer Verlag (7 Stuttgart 72 [Hohenheim], Postfach 53); Matthew Hodder Group Sales, Ltd. (Saint Paul's House, 8 Warwick Lane, London EC4P, 4AH); Lloyd-Luke, Ltd. (49 Newman Street, London W1P4BX); The Publishers Association (19 Bedford Square, London WC1); Georg Thieme Verlag (D-7000 Stuttgart 1, Postfach 732); Charles

C. Thomas—Publisher (301-327 East Lawrence Ave., Springfield, Illinois 62717).

Information on Hansen's disease in Pakistan.

Freundeskreis Karachi, Freienohl, Hauptstrasse 31, has been working for the leprosy center in Pakistan for ten years with good results. Our work is mainly based on information from Dr. Ruth Pfau, Karachi.

Quarterly circular letters are sent from Freundeskreis Karachi to approximately 2,000 readers both at home and in foreign countries. These circular letters present general information concerning the results of Dr. Ruth Pfau's work with Hansen's disease. For further information about her work among the leprosy patients in the slums in Pakistan, a series of slides are at our disposal. The slides are shown at special meetings and interesting discussions take place, over the subject: in what ways can we help? Further, our work is supported by the local press and through the Informations und Basarstand, Freienohl, Hauptstrasse 9. The 25th circular letter published in book form by Freundeskreis Karachi: *Ruth Pfau als Leprosärzthin in Pakistan, 1960-1973*, authoress Mrs. Marzia Sievers-Peerzaada, will be another good publication concerning Hansen's disease. Freundeskreis Karachi cooperates with Deutschen Aussätzigen-Hilfswerk e.v. (DAHW) and Misereor Aachen.

"TALRES Solar Bath."

TALRES "Trans Africa Leprosy Rehabilitation and Research Service" demonstrates a simple method of physiotherapy for hands with contractures applicable for developing areas where sunlight but not continuous electricity is available.

The solar bath is an answer to the problem of how to use a wax bath without electricity or open flame heating. The indications and use of the solar bath are those for the conventional wax bath. Demonstration models of the "solar bath" are exhibited along with reproduction of an article in *LEPROSY REVIEW* giving the technical details on the solar bath.

Exhibited are also flip charts developed for the illiterate to communicate hand, face and feet care for anesthetic hands, face and

feet. This flip chart uses principles developed by Mr. Fuglesang as a result of psychological testing of illiterate peoples in Africa.

Indian Surgical Company, Madras 28, India.

This company is the surgical instrument division of the parent company Indian Sterilizer Co., Madras-28. The parent company came into business in 1958 by manufacturing sterilizers, operation tables, lamps, general equipment and surgical instruments. To ensure better control of quality this firm came into existence for the manufacture of surgical instruments only.

Besides other surgical instruments the firm has been proud of being the largest exporters of instruments used for leprosy reconstructive surgery. Our name has been mentioned in the book published by Dr. E. P. Fritsch, entitled *Reconstructive Surgery in Leprosy* with the list of instruments needed. We were the first to design and manufacture the Andersen Tunneller under direct instructions from Dr. Paul W. Brand and Dr. Andersen.

The managing partner of the firm has had training in West Germany and as such the instruments are tested at various stages of manufacture. All our products carry a guarantee of five years. All items are manufactured of stainless steel and treated on a scientific basis, being thoroughly aware of the purposes for which the instruments are used.

Merck. E. Merck, Darmstadt.

E. Merck, Darmstadt, presents a new indifferent cream-base "UNGUENTUM Merck."

"UNGUENTUM Merck" is a combination of O/W and W/O, specially based for use in the dermatology field. It is a good basement for combinations, and can also be used as an indifferent cream. E. Merck, Darmstadt, also presents a steroid-ointment "CORTICODERM Merck" (in many countries named "DECODERM").

Schering-Plough Corporation. New Jersey, U.S.A.

Schering Corporation, U.S.A., and Plough, Inc., wholly-owned subsidiaries of Schering-Plough Corporation, employ

some 12,000 people. The International Division of Schering Corporation markets the products of both subsidiaries outside the United States and employs more than one third of Schering-Plough people. All but a few are citizens of the countries in which they are employed.

The corporation's diversified product lines include ethical pharmaceuticals, such as antihistamines, anti-infectives, corticoids, and psychopharmaceuticals; proprietary medicines, such as cold products and laxatives; cosmetics, sun care products, and toiletries; household products; animal-health products; and medical-laboratory diagnostic aids. Expenditures for research and development have grown to be more than US\$25 million per year. Schering-Plough products are available in more than 150 markets around the world.

Leprosy film.

You are cordially invited to see the English version of the Science Service film on leprosy. Authors: Prof. K. H. Schaller, Koblenz; Dr. H. Rieth, Hamburg; Prof. K. H. Spitz, Wien. Coauthors: Browne, Convit, Godal and Ross. Regi: E. Berger. Camera: J. Balvich, M. Dhillon, E. Hirshbain and P. Sela. Production: Science Service, 1 Berlin 31.

This first international, scientific teaching film has been produced in connection with the centenary for the discovery of the *Mycobacterium leprae* Hansen. Leading leprologists in Ethiopia, Venezuela and Israel have assisted in its production.

First a historical and epidemiological introduction is given by the Leprosy Section of the World Health Organization. Second, follows a presentation of the internationally approved classification of the various stages of the disease. The different clinical pictures are correlated with the light microscopic, electron microscopic and microbiologic findings. Modern diagnostic methods permit an exact and extended division into disease stages. A more definite evaluation of the prognosis is achieved, as well as better planning of control and treatment with sulfones, antibiotics and other therapeutic drugs. The film will be shown at intervals in the Student Center. Time will be announced.