Prostitutes have played a major role in PPNG epidemics in Los Angeles and New York City, and innovative measures were often necessary to identify such persons. The lack of organized groups of prostitutes in Dade County makes identification even more difficult. Other factors have yet to be clarified, such as the role of gonococcal plasmids in maintaining the epidemic.

(Source: Wayne L. Greaves, M.D. and Phillip W. Strine. Centers for Disease Control, Center for Prevention Services, Division of Venereal Disease Control, Atlanta, Georgia, USA.)

Editorial Comment

Penicillinase-producing *N. gonorrhoeae* (PPNG) have been isolated in Argentina, Canada, Chile, Colombia, Costa Rica, Mexico, Panama, Suriname, Trinidad and Tobago, and the United States. Epidemiological evidence obtained from interviews of infected patients suggests that PPNG are also present in Grenada and Saint Lucia. To this growing list we can now add El Salvador, Grand Cayman Island, Grand Turk Island, and Honduras. Clearly PPNG are rapidly becoming well established in Caribbean and Latin American countries.

The outbreak in Miami and the special case who almost certainly returned to Honduras with inadequately treated PPNG illustrate the potential for rapid spread of PPNG to other countries. PPNG pose a serious threat to gonorrhea control efforts. The loss of penicillin as an inexpensive, effective first drug for treatment of urethritis, results in a significant increase in treatment costs. Extensive use of second- and third-line drugs may be beyond the resources of most sexually transmitted disease control programs.

It is imperative that small pilot surveillance projects such as the Inter-American Collaborative Study of Antibiotic Susceptibility of *N. gonorrhoeae* (financed by the International Development Research Center of Canada in Argentina, Brazil, Chile, and Jamaica) be initiated to determine the presence and extent of PPNG. Ongoing or periodic monitoring of the frequency with which PPNG are isolated may assist indirectly in determining the efficacy of penicillin treatment programs.

Development of a Leprosy Vaccine

Among the objectives of the ongoing research programs in leprosy immunology throughout the world is the development of a vaccine against the disease. In the Region of the Americas, the Pan American Center for Research and Training in Leprosy and Tropical Diseases (CEPIALET) in Caracas, Venezuela has been working on a vaccine for the prevention and cure of leprosy. The Director of CEPIALET, Dr. Jacinto Conavit, recently described some of the findings of this work in a lecture given at the VI Public Health Congress held in Barquisimeto, Lara State, Venezuela. What follows is a summary of that presentation.

A specific immunologic defect for *Mycobacterium leprae* has been demonstrated in leprosy patients and in healthy persons who live in areas where leprosy is endemic. This immunologic defect can be found in healthy persons with persistently negative response to lepromin (Mitsuda reaction), in patients with the indeterminate form of leprosy who show a negative response to the Mitsuda test, and especially in the lepromatous form or in that part of the spectrum that is closest to being so.

Most of the population is highly resistant to leprosy in any of its forms; one can assume, therefore, that even patients with tuberculoid forms of the disease and those in the area of the spectrum closest to these forms, also have a partial immunologic defect.

The specificity of the immunologic defect was demonstrated several years ago with different species of *Mycobacterium*. The forms of low resistance to the disease respond to *M. leprae* by producing an undifferentiated macrophagic "incompetent" granuloma with numerous intracellular microorganisms. On the contrary, the behavior of these forms of the disease to BCG results in the production of an immune granuloma made up of epithelioid cells and giant cells with lymphoid cell infiltrate where intracellular microorganisms are not found.

A simple explanation used to interpret the immune defect is that it could constitute a macrophagic defect in the presentation of the antigen to the lymphoid cells necessary for development of the phenomena of cell-mediated immunity. This defect can be observed in the cell's inability to digest the bacilli. In these individuals, tests in vivo and in vitro do not show sensitized lymphoid cells.

Other possible explanations of the phenomenon could be absence of the recognition factor for the spe-
specific antigen that depends on the lymphoid system or the development of suppressive cells. When persons not sensitized to BCG and incapable of discarding M. leprae from their tissues are injected with a mixture of BCG + M. leprae, both microorganisms are eliminated from the site of the injection after two weeks. This may be due to the fact that macrophages have a specific defect for initiating the cell-mediated immunity mechanism that can be overcome by the activation produced by another Mycobacterium for which there is no immunologic defect.

The mechanism initiated by the second Mycobacterium implies that the development of cell-mediated immunity includes two elements: one that depends on the macrophage and can be induced nonspecifically, and another that depends on the lymphocyte and is specific.

The postulation of a specific macrophagic defect as a mechanism for the development of leprosy is apparently the first example of this type of disorder, but a similar mechanism could be invoked in diseases induced by intracellular parasites, especially when these parasites have a complex cell wall.

Two observations have been decisive in the work of developing a leprosy vaccine at CEPIALET: 1) the local response to the combination of killed M. leprae + viable BCG which served as a model in efforts to induce a systemic cell-mediated type of immune response; 2) experience has demonstrated that separate applications of BCG or M. leprae are not effective in inducing cell-mediated immunity responses to M. leprae in healthy or in sick persons who have a persistently negative Mitsuda. Results obtained in experimental animals (mice and guinea pigs) cannot be extrapolated to man because these animal models do not present the specific immunologic defect that has been demonstrated in man.

The combination of M. leprae (killed with heat and purified by the Draper method) with viable BCG has been used in studies in Venezuela as a vaccine for contacts and as immunotherapy in patients who present clinical disease.

The Mitsuda-negative contacts experienced a complete immunologic change eight weeks after vaccination. Patients with indeterminate leprosy and negative Mitsuda (potentially lepromatous) needed more than one vaccination, and, to date, of the 45 patients, 43 presented favorable immunologic changes, the remaining two being under observation.

Repeated vaccinations (from 4 to 6 times) have induced favorable clinical and histopathological modifications in the serious forms of the disease [lepromatous (LL) and borderline lepromatous (BL)] where an appreciable number of cases presented immunologic changes as well as a significant reduction in bacterial population.

The secondary effects of the vaccination have been very limited, and the few observed cases with neuritis and reactions have been easily controlled with thalidomide and dexamethasone.

Clinical, anatomopathologic, bacteriologic, and immunologic results observed both in contacts and in the low resistance forms of the disease support the idea that vaccine therapy will take a prominent place in leprosy treatment. In areas where leprosy is endemic, the vaccine would be administered as a preventive measure to the group at high risk of contracting and developing the disease, such as domiciliary and extradomiciliary contacts.


The Health Field Concept — A Canadian Perspective

A basic problem in analyzing the health field has been the absence of an agreed conceptual framework for subdividing it into its principal elements. Without such a framework, it has been difficult to communicate properly or to break up the field into manageable segments which are amenable to analysis and evaluation. It was felt keenly that there was a need to organize the thousands of pieces into an orderly pattern that was both intellectually acceptable and sufficiently simple to permit a quick location, in the pattern, of almost any idea, problem or activity related to health: a sort of map of the health territory.

Such a health field concept envisages that the health field can be broken up into four broad elements: human biology, environment, lifestyle, and health care organization. These four elements were identified through an examination of the causes and underlying factors of sickness and death in Canada, and from an assessment