"How soon can I discover if it does?" Statistically valid data may confirm or refute early clinical impressions.

Good public relations may be fostered if the investigator can communicate directly with his patients in their own language. The more he knows of local customs and beliefs about leprosy, the better; he may be saved from committing faux pas, and may learn much, for instance, regarding the existence of a black market in drugs, previous treatment of patients, sale of tablets that have been secreted under the tongue or even regurgitated after swallowing, etc.

In some countries, good public relations between investigatory medical teams and the public have been endangered by reason of the lack of correlation between such teams, and also by the apparent lack of human concern on the part of the investigators. Simple villagers complain of visitors who descend on them in successive waves to take blood or skin snips or to examine them piecemeal, showing no consideration for them as human beings or for their sicknesses. In surveys for leprosy, and in mobile or static treatment schemes for leprosy patients, it is important to provide facilities for treating minor intercurrent diseases.

These are some of the ethical and nonmedical factors that may make or mar not only a therapeutic trial, but also the reputation of the investigator and the good name of an institution, to say nothing of the cause that the scientist and the humanitarian alike have at heart, viz., the passionate investigation of leprosy and the cure of the individual sufferer.

—S. C. Brower

### The Lymphocyte and Resistance to Leprosy

Immunosuppression in bacterial disease as a determining factor in the pathogenesis of different types of leprosy has been the subject in recent months of an increasing number of published scientific reports. It may be noted in passing that the related phenomenon of rejection of grafted tissue has also attained wide popular understanding through the television and public press coverage of recent attempts at human organ transplantation.

The now apparent role of immunologic suppression in leprosy and the part it plays in lepromatous disease were set forth in detail by Shepard in a recent editorial in The Journal. Referring to experiments by Bees and his associates, by Gangas, and by himself and his colleagues, Shepard called attention first to a marked trend in recent research toward attempts by immunosuppressive measures to produce a more severe and extensive experimental leprosy than the usual infectious process induced by M. leprae in the mouse foot pad, and, second, to efforts in exploration of the role of immunosuppression in the lepromin reaction and in the phenomena of allergy and energy in leprosy in man.

Shepard's editorial noted that these two fields of research were discussed at a workshop on The Immunology of Leprosy, in October 1967, sponsored by the U.S.-Japan Cooperative Medical Science Program. In the interval since that editorial was written the discussions at that workshop have been printed in abstract. Among the papers presented were several that bore on what seems to be a basic factor in immunosuppression, viz., interference with the protec-

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2. Abstract from workshop on immunology of leprosy, Experimental Hematology, No. 15, 1968, 135-137. (Published by the Biology Division, Oak Ridge National Laboratory)
tive role the lymphocyte plays against bac-
terial infection.
The now well known studies of Rees and his associates, and Shepard and his col-
h leagues, on the depression of lymphocyte transformation by thymectomy, irradiation and other means, were extended at the very beginning of this year by these investi-
gators on the artificial production of lepro-
matous-type disease in mice.

Other studies previously in course in the
general field were supplemented at the
workshop by their original participants also
through new reports. Bullock has recently
published in more detail data on which his
expressed views were based, i.e., that lepro-
losy is associated with a generalized de-
pression of the delayed allergic inflamma-
tory response, which was found to be much
greater among patients with lepromatous
leprosy than among patients with tubercu-
loid disease. This has led to additional
editorial discussion. That the two phenom-
ena of anergy to lepromin and low resist-
ance to leprosy are related in some way no
one doubts, and indeed they have their
counterpart in the case of other microbial
diseases. Tuberculosis, which has so many
analogies with leprosy, is a notable exam-
pole. Laboratory animals and man, after
infection with tubercle bacilli, generally
become highly sensitive to the antigenic
component of the tubercle bacillus in tu-
berculin. But that sensitivity can be de-
pressed or abolished by a variety of proc-
ces, including intercurrent disease.
Measles, for example, greatly depresses a
previously disease-acquired sensitivity to
tuberculin, and at the same time apparent-
ly reduces resistance to the disease, as
evidenced by not infrequent exacerbation
of the illness following the measles infec-
tion. To be sure the difference in
manifestations between the lepromatous
and tuberculous types of leprosy is far
greater than that between progressive tu-
berculosis and its acute exacerbation after
resistance-depressing intercurrent infec-
tion, but a related principle may be in-
volved. Also, in tuberculosis, there appears
to be no clearly defined hereditary predis-
posing anergic state, as there may be in
lepromatous leprosy, although some of
Lurie's results with inbred rabbit families
suggest that such might be the case.

The relation of the lymphocyte to the
two related but still independent phenom-
ena of hypersensitivity to tuberculin and
resistance to disease was recognized years
ago. M. W. Chase noted as far back as
1945 that hypersensitivity to tuberculin
could be passed from a tuberculin-positive
guinea-pig, sensitized by injection of dead
tubercle bacilli, to a normal guinea-pig by
the transfer of leucocytes or washed lymph
node or spleen cells from the former. The
observation was confirmed in detailed ex-
periments by Kirchheimer and Weiser, and
has since been repeated many times. But
there has been relatively little tenden-
cy until recently to relate it to the path-
ogenesis of the disease characterized by
the hypersensitive state. Not much atten-
tion has been paid in texts and other com-
prehensive treatises on leprosy to the basic
importance of the lymphocyte and its
transformation to the larger cells of blast
type concerned with immunologic reac-
tions. A number of papers in which the

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6 Bullock, W. E. Depression of the delayed-type
577.
7 Wadsworth, E. N., Shearer, J. N., Truman,
J. R., and Black, J. B. Impaired delayed hypersen-
sitivity in patients with lepromatous leprosy. Lancet
2 (1966) 773-775.
8 Bullock, W. E., Jr. Studies of immune mech-
nisms in leprosy. 1. Depression of delayed allergic
278 (1968) 256-261.
J. Leprosy 36 (1968) 68-68. (Abstratal)
11 Lurie, M. B. Resistance to Tuberculosis. Experi-
mental Studies in Native and Acquired Defensive
Mechanisms. Cambridge, Mass., Harvard University
12 Chase, M. W. The cellular transfer of cutaneous
& Med. 59 (1945) 154-155.
13 Kirchheimer, W. F. and Weiser, R. S. The
tuberculin reaction, 1. Passive transfer of tuberculin
sensitivity with cells of tuberculous guinea pigs.
subject is approached through special techniques are appearing currently, however. It may well be that this new appreciation

10 See for example: Morgenfeld, M. C., Bonaparte, V. de and Rodriguez Paradisi, E. Blinds in leprosous leprosy, Lancet 1 (1966) 308-309. (Letter to the Editor) (Abstract, Internat. J. Leprosy 36 (1968) 241-255). These authors have prepared an article for future publication entitled "Delayed cutaneous hypersensitivity in leprosous patients. Response to leucocyte transfer factor."

11 Editor's note. There was extensive discussion of this general subject, with numerous reports of progress, at the Ninth International Leprosy Congress, London, 16-21 September 1968.

of differences in intrinsic cellular mechanisms in the body's defenses against leprosy will prove to be one of the most important approaches in recent years, opening a new field in understanding its polar types, and the phenomena of susceptibility to leprosy in general. 12

12 E.R.L.