chloride, nitrobenzene, di-ethyl aniline, pyridine, and carbon tetrachloride.

Results are much better when the chemicals of the first list are used.

ROSS BONAR
FLOYD BONAR
EARL C. H. DAVIES

CHEMISTRY DEPARTMENT
WEST VIRGINIA UNIVERSITY
MORGANTOWN, W. VA.

## SILK CELLOPHANE FOR LANTERN SLIDES

RECENTLY Warren,[1] Walden,[2] and Wells[3] suggested the use of plain cellophane as a recipient of carbon in projection lantern slides. As a further suggestion, special du Pont Number 300 white silk cellophane takes ink directly from the typewriter ribbon without smudging and, after momentary drying, the record is permanent. If the original impressions are gone over for the second typing, legibility is enhanced. The cost of this special silk cellophane is less than one cent per slide.

FREDRICK F. YONKMAN

SCHOOL OF MEDICINE
BOSTON UNIVERSITY

# SPECIAL ARTICLES

## THE RELATIONSHIP OF BACTERIUM GRANULOSIS TO TRACHOMA

THE question of the relationship of *Bacterium granulosis* to the etiology of trachoma has been discussed in a recent publication.[1] As stated in that article the organism of Noguchi "merits consideration as the etiological factor" in the disease. This view was expressed in spite of the accumulation of negative evidence of many workers, including the writer, and the doubts which have been expressed by some who have been the most sanguine in their expectation of the solution of the trachoma problem following the isolation of this organism with which a transmissible granular condition may be produced in monkeys. Such doubts are based on the failure of many investigators to isolate the organism from trachoma in different parts of the world and the considerable number of negative results which have been obtained in attempting to produce trachoma by inoculation of human subjects with the organism.

I reported that the granular condition originally induced with difficulty in *Macacus rhesus* monkeys by inoculation with cultures of *Bact. granulosis* was very readily transmissible and that transmission could be accomplished by merely rubbing a sterile swab over the affected conjunctiva and then rubbing it over the conjunctiva of a normal animal, thus demonstrating the fact that it is not necessary to excise tissue and to inject this subconjunctivally. In other words, as described by one worker, the granular condition may be described as one which is "highly infectious."

The question arose: "Is human trachoma as readily transmissible?" There are a number of clinicians who, after long experience with trachoma, still question the ready communicability of the disease. On the other hand, Taborisky[2] inoculated the conjunctiva of 5 blind subjects with the conjunctival secretion of trachoma cases and all acquired the disease.

In order to obtain a comparison between the granular condition induced in monkeys by inoculation with cultures of *Bact. granulosis* and that induced by direct transfer of secretions from trachoma cases, a series of monkeys was started in the early part of 1932 in which granular lesions were produced by repeated swabbing of secretions from trachoma cases in Rolla, Missouri. A number of attempts had previously been made to accomplish this without success. A granular condition which developed slowly was obtained in 2 monkeys and from one of these was transmitted to another monkey by repeated swabbing. As reported recently[3] two parallel series of monkeys (8 in each series) were then considered, one in which attempts were made to transmit the granular condition originally induced by inoculation with cultures of *Bact. granulosis* and the other in which attempts were made to transmit the granular condition originally induced by transfer from trachoma cases. Four monkeys in each series had been previously inoculated with a vaccine of *Bact. granulosis* with the idea that the test might show whether there were immunological differences in the two conditions. In the "culture" series 5 of the 8 animals developed the granular condition after one swabbing from an infected monkey, and one after two swabbings, and one died. In all these the granular condition occurred spontaneously in the uninoculated eye. In the "direct transfer" series all the monkeys were swabbed 3 times (on consecutive days) and one of the 8 developed a granular condition in both eyes, 6 remained unaffected and one died. Of the 6 unaffected, 5 have since been swabbed from infected monkeys, one a single time, one 2

[1] K. L. Warren, SCIENCE, 76: 573, December 16, 1932.
[2] B. H. Walden, SCIENCE, 77: 91, January 20, 1933.
[3] F. L. Wells, SCIENCE, 77: 91, January 20, 1933.
[1] Ida A. Bengtson, *Pub. Health Rep.*, 47: 1914, September 19, 1932.
[2] J. Taborisky, *Graefe's Arch. f. Ophth.*, 123: 140, 1930.
[3] Ida A. Bengtson, *Pub. Health Rep.*, 47: 2281, December 9, 1932.