

previous occasions, and from time to time aid has been extended to some of those in need. The report of these experiments published for the use of the Senate in 1911 is one of the most interesting volumes in American medicine. However, these men have not been honored by congress alone. The American Medical Association at the Saratoga session in 1902 sent the members of the Yellow Fever Commission a vote of thanks and resolved that the far-reaching beneficence of their discovery was second in magnitude only to that of Jenner's discovery of vaccination. Scientific societies throughout the country paid similar respects; the Virginia state medical society has made the birthplace of Reed a national shrine, and monumental structures have been named in honor of other members.

These are the Americans who risked their lives to help discover the method of transmission of a fatal epidemic disease. They volunteered to be injected with blood from patients dying of yellow fever or to be bitten by infected mosquitoes, to sleep in beds in which patients died and to wear the clothes of patients who died. Thus they helped to drive yellow fever almost from the face of the earth. Our own land had previously been invaded at least ninety-five times with a loss of not less than a hundred thousand lives. It seems incredible in the light of present knowledge that epidemics of yellow fever have taken 3,454 lives in New York, 10,038 in Philadelphia, 4,565 in Charleston, 7,759 in Memphis, 2,000 in Norfolk and 41,348 in New Orleans, besides sweeping through Baltimore and many smaller cities. In those days people fled from their homes, for nobody knew whence or how the scourge came.

When the U. S. Army Commission was sent to Cuba in 1900 to investigate the cause, yellow fever was still taking the lives of American soldiers, although three years before Sanarelli believed that he had discovered the cause. Major Reed, the chairman, knew that Sanarelli's work had been accepted by some American investigators. The commission therefore gave its entire time at first to a search for *Bacillus icteroides* and after a study of twenty-one cases during life and eleven necropsies concluded that it bore no causative relation to the disease. Attention was then given to Finlay's theory that yellow fever was transmitted by mosquitoes. A camp was built near Havana, the buildings being screened so that mosquitoes could be kept in or out, as desired. The work was organized so that every step was controlled. Here the volunteers whom congress has honored offered their lives and lived for weeks in the face of death. Some of these men did not contract yellow fever but twenty-two cases were produced in the course of the experiments. All except Dr. Jesse W. Lazear recov-

ered. It was proved that yellow fever is transmitted by *Stegomyia fasciata*, that it can be transmitted by the injection of blood from yellow-fever patients and that it is not transmitted by exposure to fomites.

In the further recognition of this achievement and in honoring and assisting these men, congress has reflected great credit on the whole country. The world has received the benefaction they bestowed.—*The Journal of the American Medical Association*.

## SCIENTIFIC APPARATUS AND LABORATORY METHODS

### SOME USEFUL PETROGRAPHIC METHODS

"A LOCATION Finder for Microscopes" described in the February 15 issue seems to me a rather cumbersome and complicated method of doing what we have been doing for years with an ordinary mechanical stage on a (Leitz) petrographic microscope. The slide always fits into the stage in a fixed position relative to the optic axis of the microscope, and the coordinates of the object in view are simply read off and recorded, as 15/7, for example.

While on the subject, it may interest users of petrographic microscopes to learn of a method of determining refractive indices in thin sections, powders, etc., which has entirely superseded in this laboratory the Becke Line method, shading the mirror with a card, etc. The object is viewed with a No. 3 objective (Leitz microscope) with the polarizer in and the condenser out. The analyzer is slowly moved in, and the boundary between the adjacent mineral grains, or the mineral and immersion liquid, becomes sharply illuminated or shaded, as the relative index is less or greater. The method is exceedingly delicate; and the optical theory will be evident on brief consideration of the passage of light in the optical system.

Another small item which has been found useful is in the use of the pinhole and the oil-immersion ( $1/_{12}$ ) lens in securing interference figures of very small grains. It has been found that with the ocular removed, as is necessary for securing sharp definition, the Bertand lens makes a quite satisfactory provisional ocular, and may be used for orthoscopic vision while centering, etc., for conoscopic.

CHARLES MILTON

GEOLOGICAL DEPARTMENT,  
THE JOHNS HOPKINS UNIVERSITY

### RECORDING BY PERFORATING

PHYSIOLOGISTS and psychologists may be interested in a new principle of accurate recording which has proved to be practical, convenient and inexpensive.