

and efficiency of amebicides. An endless series of interesting experiments suggest themselves. It is certainly reasonable to suppose that a skilled and experienced investigator can derive vastly more information from a series of tests and observations made upon a comparatively complex organism of which the multitudinous and highly complex reaction behaviors are constantly before the eye, than from a series of tests which reveals nothing more than an indication of either death or no death, as in the older methods for the determination of the phenol coefficient. Undoubtedly the proposed method will in time give us more accurate information regarding the manner in which the different germicides and disinfectants cause death. A few observations made upon *Paramecium* in the presence of toxic agents under the ultramicroscope would indicate that this method will disclose many interesting facts regarding the behavior of toxic and germicidal substances *via* the realms of colloidal chemistry, in which the beginnings have already been made. It is for example known that bacteria suspended in liquids behave as negatively charged colloids and are, therefore, driven to the anode end of the electric current. Bacteria are precipitated by the ions of the heavy metals and they take up certain of the disinfectants according to the law of adsorption. Disinfectants may kill by virtue of forming chemical compounds within the bacterial cell, or they may kill because of the precipitating effects upon the plasmic proteins, or through the adsorption and subsequent absorption, osmosis and chemical decomposition of the chemically or physically (colloidally) active ions.

UNIVERSITY OF NEBRASKA,
LINCOLN, NEBRASKA.

ABSTRACT OF DISCUSSIONS.

The foregoing paper was discussed by Drs. Bernard Fantus, Horatio C. Wood, Jr., and H. C. Hamilton. It was the consensus of opinion that the weak point in the present methods is that they have no practical application. The effectiveness of a given disinfectant varies to a very great degree with the organism upon which it is allowed to act. A disinfectant might be very effective in killing streptococci but almost useless against *Bacillus typhosus* and *vice versa*. One of the objections to the method of testing disinfectants as proposed by the Hygienic Laboratory of the U. S. Public Health Service is the high cost of conducting the test. The need for a more satisfactory and practical test was generally conceded.

SOME OBSERVATIONS RELATIVE TO TRAINING IN DRUG ANALYSIS.*

BY C. O. EWING.

When your chairman suggested the preparation of a paper dealing with the teaching of drug assaying and analysis, it seemed to me that the request would more properly have been addressed to one who had had more collegiate teaching experience. Upon further consideration, however, it occurred to me that it might not be amiss to point out certain phases of the subject that some years of Federal and commercial experience have accentuated.

With regard to preliminary training, drug analysis, even in a semi-routine control laboratory, is an occupation requiring a broad general training. It is

* Read before Section on Education and Legislation, A. Ph. A., City of Washington meeting, 1920.