

guaiac to guaiac blue. This prevention is due to the number of bacteria present. Up to about three millions of bacteria per cc the action of the oxidases is accelerated and from then on their action is retarded.

IRVING KUSHNER

ALEX. S. CHAIKELIS

COLLEGE OF THE CITY OF NEW YORK,
LABORATORY OF PHYSIOLOGY

CULTIVATION OF THE VIRUS OF TOBACCO MOSAIC BY THE METHOD OF OLITSKY

RECENT publications of Olitsky¹ on the cultivation of the virus of mosaic disease of tobacco and tomato attracted unusual attention. The intense but fruitless search which has been made by numerous workers for the causal agent of this pathological condition has made it evident that the problem presents many difficulties. Perhaps no type of plant disease has been more seriously studied by pathologists during recent years than mosaic. It is not surprising, therefore, that Dr. Olitsky's announcement of artificial cultivation of the virus should receive immediate and enthusiastic consideration.

The objective aspect of Olitsky's experiments is extremely simple and should be easily duplicated by any one caring to make the test. The bearing of positive results in this connection on future studies of the general problem of mosaic would undoubtedly be very great, and any effort to verify the findings reported is fully warranted. With this in view, an exact repetition of the experiments described was undertaken. The method followed is essentially as follows. Eighty grams of young tomato tissues were minced and then mortared to a pulp. This was mixed with 250 cc of sterile, distilled water. The mixture was centrifuged for one hour at 1,500 to 2,000 revolutions per minute. The supernatant liquid was passed successively through two Berkefeld N size filters and disposed in 3 to 5 cc portions in small test tubes. This, if it was found to have a pH value between 5.3 and 6.0, constituted the "culture" medium. This medium was held at 28 to 30 degrees C. for seven days to insure sterility. The inoculum used at first consisted of Berkefeld V filtrate from inoculated tobacco and tomato extract. Later sap was drawn directly from the stems of infected plants by means of capillary glass tubes and placed at once into the culture medium. Each culture tube received either 0.1 to 0.2 cc of the infectious filtrate or 0.01 cc of the sap as an inoculum. Succeeding transfers were made

by putting 0.1 to 0.2 cc from the first culture into a second as a subplant and so on indefinitely. This procedure, of course, made a series of dilutions of the original inoculum, and Olitsky concludes that growth must have taken place if a decrease of infectiousness did not accompany the succeeding transfers. Every detail of Olitsky's procedure was carried out as completely as possible with one single exception, namely, the use of tobacco instead of tomato plants as tests of the infectiousness of the various cultures. This should not, however, influence the results, as tobacco is quite as susceptible to mosaic as are tomatoes. An additional check (not used by Olitsky) was introduced by the use of sterile, distilled water as a "culture" medium. All dilutions or transfers were made at the same time and in the same manner in both the water and tomato extract. Ten plants were inoculated with each dilution in each of three series; so that the figures given below represent the number of infections in a population of 30 plants for each transfer number. The results of the three separate series of experiments, including more than 260 plants, are given in summary form here.

NUMBER OF PLANTS INFECTED IN THIRTY INOCULATIONS

Transfer No.	Water.	Extract.
1	5	5
2	3	3
3	1	1
4	3	0
5	1	0

The original undiluted filtrate which was used as an inoculum gave 21 infections in 30 inoculations. It is clear that so far as these results are concerned Olitsky's findings are not confirmed, for there is no indication of an increase of the virus as the transfers proceed. The water cultures gave a rate of infection slightly higher than those made in tomato extract in the higher dilutions. These data are, no doubt, too meager to establish conclusions contrary to those reached by Olitsky, but they suggest the desirability of greater accumulation of experimental evidence, and are given here in hopes that they may assist in keeping the question open until the facts are fully established. It appears to the writer not impossible that Olitsky's results may have an interpretation other than that indicated in his articles.

MAURICE MULVANIA

NORTH CAROLINA ACADEMY OF SCIENCE

THE twenty-fourth annual meeting of the North Carolina Academy of Science was held at State College, Raleigh, May 1 and 2, 1925. The academy is making an especial effort to help the cause of science

¹ Olitsky, Peter K., "Experiments on the cultivation of the active agent of mosaic disease of tobacco and tomato." *SCIENCE*, Vol. LX, No. 1565, 1924, p. 592; "Experiments in the cultivation of the active agent of mosaic disease in tobacco and tomato plants." *Jour. of Exp. Med.*, Vol. XLI, No. 1, pp. 129-136, 1925.

in the high schools and to that end has provided a prize to be administered by a committee for excellence in work in high school science. Present membership was reported as 250. Officers for the coming year were elected as follows: *President*, J. P. Givler, North Carolina College for Women; *Vice-president*, J. O. Halverson, Department of Agriculture, Raleigh; *Secretary-treasurer*, B. Cunningham, Duke University; *members of the executive committee*, H. B. Arbuckle, C. M. Heck, A. Henderson.

Officers for the North Carolina Section of the American Chemical Society are: *President*, F. E. Rice, State College; *secretary*, L. B. Rhodes, Dept. Agriculture, Raleigh; *councilor*, J. M. Bell, Univ. of North Carolina.

The following papers were presented:

Presidential address, *The life and habits of the honey bee*: H. B. ARBUCKLE.

Results of the plankton studies of Chesapeake Bay: BERT CUNNINGHAM, et al.

Variations of proteins in corn: H. B. ARBUCKLE and O. J. THIES, JR.

A study in the direction-sense of animals: J. F. DASHIELL.

Development of some disc fungi: F. A. WOLF.

The physiography of Brazos County, Texas: E. O. RANDOLPH.

Two rare types of abnormality in cotton seeds: S. G. LEHMAN.

Morphological ecology of certain Savannah plants: C. F. WILLIAMS.

Results of soft pork investigations: J. O. HALVERSON and E. H. HOSTETLER.

Seasonal catch of snakes at Raleigh: C. S. BRIMLEY.

New ideas concerning mass: A. H. PATTERSON.

Some Homoptera from Cuba: Z. P. METCALF.

Some properties of ice crystals: E. K. PLYER.

Meteorological inquiries from the viewpoint of 1795: L. A. DENSON.

Some factors affecting the growth of young rats: F. W. SHERWOOD.

Investigation on the germinating and heating of cotton seed in warehouse storage: E. E. RANDOLPH.

Loessial soil and the world's food supply: COLLIER COBB.

The excitation of the O-energy levels in tungsten by electron bombardment: O. STUHLMAN, JR.

The rate of rotation of a Foucault pendulum: K. B. PATTERSON.

Observations on conjugation in Spirogyra from living material: J. N. COUCH.

New water molds from the soil: W. C. COKER and J. V. HARVEY.

The present status of the high school science program: C. M. HECK.

An oil-bearing soft pelite from Ontario, Canada: COLLIER COBB.

Methods of investigation in social psychology: C. C. TAYLOR.

The structure of the atomic nucleus: A. H. PATTERSON.

Oil-bearing shales of North Carolina: F. C. VILBRANDT.

Models of elementary crystal structure from X-ray evidence: OTTO STUHLMAN, JR.

Riccia sorocarpa, Bisch.: H. L. BLOMQUIST.

X-rays and their biological effects: L. H. SNYDER.

The effect of heat on the viscosity of some of our familiar lubricating oils: H. B. ARBUCKLE.

The development of the periblast in the teleosts: J. T. PENNY and W. R. EARL.

A simple proof of the law that the only possible periods of crystal symmetry are 1, 2, 3, 4 and 6: J. H. SWARTZ.

Iron coloration in rocks and minerals: G. R. MAC-CARTHY.

Structural conditions in the West Central Appalachians: W. F. PROUTY.

Progress on state insect survey, with comparative data on other animal groups: F. SHERMAN.

(a) *Brief notice of a new method for the radioactive determination of the age of the earth*; (b) *Brief notice of a new method of stratigraphic correlation*: J. H. SWARTZ.

The Triassic basin west of Raleigh: W. F. PROUTY.

General properties of involution in N-ary algebra: E. T. BROWNE.

Regularity of quadratic transformations of infinite series: G. M. ROBINSON.

Notes on osculating hyperboloids: J. W. LASLEY.

Graphical solution of cubics: K. B. PATTERSON.

NORTH CAROLINA SECTION AMERICAN CHEMICAL SOCIETY

Studies on the nutritive value of the peanut: the effect of peanut proteins on growth of pigs: J. O. HALVERSON and EARL HOSTETLER.

Nitration of P-cymene: A. S. WHEELER and C. R. HARRIS.

The evaluation of lubricating oils: F. C. VILBRANDT and R. M. BYRD.

Recent developments in chemical industries of North Carolina: F. C. VILBRANDT.

An investigation of the deodorizing and decolorizing of fish oils: E. E. RANDOLPH and G. L. ARTHUR.

Oxidation of sulfur dioxide with permanganate: F. C. VILBRANDT and H. A. DICKERT.

Latent heat of fusion of some nitrotoluenes: H. D. CROCKFORD.

E. M. F. studies on battery metals: F. C. VILBRANDT and R. R. SUGGS.

The refractometer as a means of determining dry matter in true and colloidal solutions with particular application to foods: F. E. RICE.

The determination of phosphorus in steel: F. C. VILBRANDT and W. M. MEBANE.

The chemist in the laundry: F. C. VILBRANDT and W. C. QUINBY.

BERT CUNNINGHAM,
Secretary.

DUKE UNIVERSITY