Professor R. F. Mehl, Carnegie Institute of Technology
Philip H. Miller, Massachusetts Institute of Technology
Dr. Clark B. Millikan, California Institute of Technology
Dr. Dana P. Mitchell, Columbia University
Professor G. N. Lewis, University of California
Donald G. Little, Westinghouse Electric & Manufacturing Company
Dr. Charles V. Litton, Litton Engineering Laboratory
Professor Francis W. Loomis, University of Illinois
Dr. Donald H. Loughridge, Carnegie Institution of Washington
Dr. Ernest M. Lyman, Massachusetts Institute of Technology
Dr. D. P. MacDougall, Bureau of Mines
Dr. Edwin M. McMillan, Massachusetts Institute of Technology
Professor Charles E. MacQuigg, the Ohio State University
Frank J. Malina, California Institute of Technology
Dr. Eli K. Marshall, Jr., the Johns Hopkins University
Dr. I. I. Rabi, Massachusetts Institute of Technology
Dr. William H. Radford, Massachusetts Institute of Technology
Dr. Norman F. Ramsey, Jr., Massachusetts Institute of Technology
Eugene J. Reardon, American Steel and Wire Company
Dr. Alfred N. Richards, University of Pennsylvania
Shepard Roberts, Massachusetts Institute of Technology
Dr. Alan R. Moritz, Harvard Medical School
Professor J. C. Morris, Princeton University
Professor H. Victor Neher, California Institute of Technology
Professor Jesse E. Ormondroyd, University of Michigan
Professor Robert N. Pease, Princeton University
A. P. G. Peterson, Massachusetts Institute of Technology
Professor Willis C. Pierce, University of Chicago
Henry H. Porter, Carnegie Institution of Washington
R. K. Potter, Bell Telephone Laboratories
C. A. Priest, General Electric Company
Redfield Proctor, Proctor, Vermont
Dr. Jabez C. Street, Harvard University
Dr. Lauriston S. Taylor, Bureau of Standards
Arthur E. Thiessen, General Radio Company
Dr. John G. Trump, Massachusetts Institute of Technology
William G. Tuller, Massachusetts Institute of Technology
Dr. Stanley N. Van Voorhis, Massachusetts Institute of Technology
Dr. Walter van B. Roberts, Radio Corporation of America
Dr. Victor L. Ronci, Bell Telephone Laboratories
W. J. Rooney, Carnegie Institution of Washington
Dr. Otto H. A. Schmitt, University of Minnesota
Dr. J. K. Senior, University of Chicago
Dr. Charles H. Shaw, the Johns Hopkins University
Dr. S. J. Simmons, Massachusetts Institute of Technology
Dr. John C. Slater, Massachusetts Institute of Technology
Professor C. R. Soderburg, Massachusetts Institute of Technology
Dr. George R. Stibitz, Bell Telephone Laboratories
Professor Bradley Stoughton, Lehigh University
Dr. Julius A. Stratton, Massachusetts Institute of Technology
Dr. Theodor von Kármán, California Institute of Technology
Dr. John von Neumann, Princeton University
Professor Earnest C. Watson, California Institute of Technology
Professor Milton G. White, Massachusetts Institute of Technology
Professor Norbert Wiener, Massachusetts Institute of Technology
D. B. Williams, Carbide and Carbon Chemicals Co.
Professor Robert S. Williams, Massachusetts Institute of Technology
Dr. Robert R. Wilson, Massachusetts Institute of Technology
Professor Louis F. Woodruff, Massachusetts Institute of Technology
Mr. Carlton A. Woodward, Jr., General Radio Company
Professor Thomas F. Young, University of Chicago
J. C. Zimmer, Standard Oil Development Co.

The statement of October 31, 1940, which the present list supplements, contains the names of 151 scientific men and engineers who had accepted appointment with the committee prior to that date. In addition to the persons named in the two lists, there are many investigators working on projects initiated by the National Defense Research Committee, but whose names are not listed because they are not working with the committee directly.

The task assigned to the National Defense Research Committee by the Council of National Defense is that of correlating and supporting scientific research on mechanisms and devices of warfare. It does not extend to such materials as food, medicine and health. For that reason the men selected to aid the committee will continue to be drawn largely from the fields of chemistry, physics and engineering.

SPECIAL ARTICLES

SAPROPHYTES ANTAGONISTIC TO PHYTOPATHOGENIC AND OTHER MICROORGANISMS

RECENTLY, bacteriologists have given considerable attention to the phenomenon of bacterial antagonism, especially in relation to pathogenic microorganisms. Dubos[1, 2] and Sickles and Shaw[3] isolated soil micro-

[1] Rene J. Dubos, *Jour. Exp. Med.*, 70: 1–17, 1939.

organisms capable of lyzing Gram-positive bacteria, while Krasilnikov and Koreniako[4] found actinomycetes producing bactericidal substances against acid-fast and Gram-positive bacteria. During the past five years, the senior writer has isolated a number of bacterial species which are antagonistic to phytopathogenic microorganisms in varying degrees. Special attention was given to two soil bacteria which showed a strong antagonism both to bacteria (Gram-positive and Gram-negative) and to certain fungi. One of these organisms was identified as *Bacillus vulgatus*, while the second one, a yellow spore-bearing bacillus, remains unidentified. The antagonism was tested on various solid and liquid media. On the solid media, a sterile zone was formed around the giant colony of the antagonist, while the liquid media into which a susceptible microorganism was introduced was usually completely cleared after 1 to 3 days, depending upon the organism used and the age of the culture. The two antagonists were active against the following phytopathogenic bacteria: *Erwinia amylovora, E. aroidae, E. carotovora, E. phytophthora, Phytomonas campestris, Ph. flaccumfaciens, Ph. insidiosa, Ph. juglandis, Ph. lachrymans, Ph. malvacearum, Ph. michiganensis, Ph. panici, Ph. pisi, Ph. sepedonica, Ph. stewarti* and *Ph. tumefaciens*. Of the fungi the following were affected by the antagonists: *Fusarium graminearum, F. lycopersici, Dematophora necatrix, Helminthosporium sativum, Verticillium albo-atrum* and *Phytophthora* sp. Other microorganisms tested with similar results were *Escherichia coli, Salmonella pullorum, S. typhi, Alkaligenes faecalis, Corynebacterium diphtheriae, Staphylococcus aureus, Streptococcus lactis, Mycobacterium phlei, M.* sp. (Grassberger's butter bacillus), 2 unidentified *Mycobacterium* sp. from the soil, *Leuconostoc mesenterioides* and *Lactobacillus acidophilus*.

The bactericides produced by the antagonists are water soluble and active in extremely small amounts. The bactericidal substance of *Bacillus vulgatus* was adsorbed by all Berkefeld filters but passed through a Chamberland L 3 filter. The bactericidal substance of the yellow antagonist was retained by both types of filters. Boiling for 60 minutes did not destroy the bactericide of either antagonist. However, when the bactericidal-containing medium of the yellow species was autoclaved, the bactericide was inactivated after 15 minutes at 10 pounds pressure, while that of *Bacillus vulgatus* was still active after 10 minutes sterilization at 20 pounds pressure. The strongest antagonism was observed in media containing dextrose and fructose, while no antagonism could be obtained either on a peptone sugar-free medium or in a nutrient medium plus maltose. Apparently the hydrogen-ion concentration did not affect the activity of the antagonists, since good sterile zones were obtained in media ranging from pH 4 to 10. All attempts to precipitate the active principle from culture solution with the aid of inorganic acids, ammonium sulfate, aluminum sulfate, aluminum nitrate, alcohols and ether, were unsuccessful. Bactericidal material of the culture media in which the antagonists grew can be concentrated by evaporating to dryness in a double boiler. Further studies on this phase of the problem are in progress. A more detailed report on the organisms discussed herewith and their relation to diseases will be published at a later date. Any one interested in these microorganisms may procure cultures gratis from the writers.

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[2] Rene J. Dubos and Carlo Cattaneo, *Jour. Exp. Med.*, 70: 249–256, 1939.

[3] Grace M. Sickles and Myrtle Shaw, *Jour. Bact.*, 28: 415–431, 1934.

[4] N. A. Krasilnikov and A. I. Koreniako, *Microbiology*, 8: 673–685, 1939.

HEMOGLOBIN REGENERATION IN ANEMIC TROUT FED LIVER FRACTIONS AND FLY MAGGOTS

IN an earlier report the development of anemia in brook trout fed synthetic diets was described.[1] Trout recovered rapidly from this anemia when fed fresh beef liver. Inasmuch as a good test animal is needed for the study of the liver fractions used in treating human anemias, this phase of research with trout was extended during the past year. Through the generosity of four manufacturers, liver fractions used in the treatment of human anemia were provided.

About 400 trout averaging 9 grams in weight were made anemic by feeding them a diet of casein 20, starch 34, dextrin 34, yeast 5, cod liver oil 3 and Osborne and Mendel's salt mixture 4. When the red cell count had dropped to 850,000, the trout were divided into groups. The liver fractions were then weighed into capsules and fed to the trout individually. In addition to the groups fed the liver fractions, three others were used, one with no supplement, one fed fresh beef liver and one fed maggots of the common house fly. These larvae were reared upon the usual mixture of alfalfa leaf meal, bran, malt and yeast.

[1] A. V. Tunison, A. M. Phillips, C. M. McCay, C. R. Mitchell and E. O. Rodgers. Cortland Hatchery Report No. 8, for the Year 1939. New York State Conservation Department, Albany, N. Y.