SCIENCE

VOL. 97 FRIDAY, MAY 7, 1943 No. 2523

The Mobilization of Science 407

Some Obstacles in the Path towards an Optimum Diet: DR. A. J. CARLSON 412

Scientific Events:

Resolutions Passed by the Hospital Bureau of Standards and Supplies; The Merck Institute for Therapeutic Research; The Copernican Quadricentennial Celebration; The American Philosophical Society; The National Academy of Sciences; Recent Deaths 416

Scientific Notes and News 419

Discussion:

National Learned Society Groups and the Public Interest: PROFESSOR LOUIS C. KARPINSKI. *Abnormal Nitrogen Metabolism in Burns:* DR. F. H. L. TAYLOR and OTHERS. *Types of Argentinian Plants of Spegazzini:* DR. M. L. FERNALD. *Optical Illusions from Train Windows:* DR. CHAUNCEY D. LEAKE 422

Scientific Books:

Systematics: PROFESSOR C. E. MCCLUNG. *Volumetric Analysis; Quantitative Analysis:* DR. FREDERICK R. DUKE 424

Special Articles:

The Role of "Folic Acid" and Biotin in the Utilization of Pantothenic Acid by the Rat: LEMUEL D. WRIGHT and DR. ARNOLD D. WELCH 426

Scientific Apparatus and Laboratory Methods:

The Use of Fibrous Sodium Pectate as a Substitute for Agar in Bacteriological Gels: R. M. MCCREADY, DR. H. S. OWENS and DR. W. D. MACLAY 428

Science News 10

SCIENCE: A Weekly Journal devoted to the Advancement of Science, edited by J. MCKEEN CATTELL and published every Friday by

THE SCIENCE PRESS

Lancaster, Pennsylvania

Annual Subscription, $6.00 Single Copies, 15 Cts.

SCIENCE is the official organ of the American Association for the Advancement of Science. Information regarding membership in the Association may be secured from the office of the permanent secretary in the Smithsonian Institution Building, Washington, D. C.

THE MOBILIZATION OF SCIENCE

IN the Senate of the United States on February 11, Mr. Kilgore introduced the following bill (S. 702), which was read twice and referred to the Committee on Military Affairs:

To mobilize the scientific and technical resources of the Nation, to establish an Office of Scientific and Technical Mobilization, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

DECLARATION OF POLICY

SECTION 1. The Congress hereby recognizes that the full development and application of the Nation's scientific and technical resources are necessary for the effective prosecution of the war and for peacetime progress and prosperity, and that serious impediments thereto consist in—

the unassembled and uncoordinated state of information concerning existing scientific and technical resources;

the lack of an adequate appraisal, and the unplanned and improvident training, development, and use, of scientific and technical personnel, resources, and facilities in relation to the national need;

the consequent delay and ineffectiveness in meeting the urgent scientific and technical problems of the national defense and essential civilian needs;

the trend toward monopolized control of scientific and technical data and other resources with lack of access thereto in the public interest; and

the absence of an effective Federal organization to promote and coordinate, in the national interest, scientific and technical developments.

The purposes of this Act accordingly are—

(1) to appraise the current use of scientific and technical knowledge, facilities, and personnel, and to develop comprehensive national programs for the maximum use of science and technology in the national interest in periods of peace and war;

(2) to mobilize for the prosecution of the war all scientific and technical facilities and personnel;

(3) to facilitate after the war the transition of the national economy from the tasks of war to peacetime enterprise;

SCIENTIFIC APPARATUS AND LABORATORY METHODS

THE USE OF FIBROUS SODIUM PECTATE AS A SUBSTITUTE FOR AGAR IN BACTERIOLOGICAL GELS

THE war has stopped importation of agar and, because facilities for its manufacture in America are not sufficient to meet the demand, the development of a suitable substitute for use in bacteriology is of extreme importance.

In this laboratory certain mixed metallic salts of fibrous pectic acid have proved satisfactory. The preparation and properties of fibrous sodium pectate have been reported by Baier and Wilson.[1] It should not be confused with the ordinary granular form which is not suitable for the purpose described. Fibrous sodium pectate may be purchased on the market[2] but is more satisfactory if purified by suspending it in 60 per cent. alcohol, adjusting the pH of the suspension to 7.5 with sodium hydroxide, filtering the pectate and drying it *in vacuo* at 60° C.

In preparing a nutrient gel, fibrous pectate to make a 2.5 per cent. solution is added to a nutrient broth which should contain 2 mg of calcium ion per gram of pectate in addition to the amount already present in the broth. A test should be made on the nutrient broth with a calcium salt to be sure that no ions are present which precipitate calcium, since that ion is necessary for the formation of the gel. Complete dispersion of the pectate is obtained by heating the mixture above 80° C. The medium is sterilized in the usual manner.

When preparing counting plates care must be taken to insure complete mixing of the bacterial suspension and pectate medium, which is somewhat more viscous than a similar agar medium. Plates should be allowed to stand at least 30 minutes prior to inversion and incubation. Pour-temperature after one autoclaving is between 45 and 50° C. The medium can be remelted in an autoclave, but each remelting raises the gelling temperature five to ten degrees.

Nutrient gels prepared with sodium calcium pectate show a smaller change of pH on sterilization than do similar agar gels. The water retention ability is slightly better than that of agar. Most organisms tested grow on pectate media without causing liquefaction and the fact that some do cause liquefaction may offer a means of differentiating them. Many tests[3] have been made on the action of microorganisms on pectate media, typical results being illustrated in Table 1.

TABLE 1

ACTION OF MICROORGANISMS ON PECTATE MEDIA

Microorganism	Growth	Liquefaction
Bacillus danicus	good	none
Escherichia coli	"	"
Pseudomonas fluorescens	"	"
Proteus vulgaris	"	"
Staphylococcus albus	"	"
Aerobacter aerogenes	"	"
Salmonella enteriditis	"	"
Bacillus subtilis	"	positive
Sporosarcina ureae	"	"
Vibrio cholerae	fair	none
Leuconostoc dextranicus	poor	"

The results in Table 1 are a representative sample of the 58 organisms tested. The growth of molds has not been tested on pectate media in this laboratory; however, the Fermentation Division, Northern Regional Research Laboratory, Peoria, Illinois, has reported that a number of molds grew well on them. Only three of those examined, *Rhizopus oryzae,* an *Aspergillus niger* and a *Penicillium italicum,* liquefied the pectate.

R. M. MCCREADY
H. S. OWENS
W. D. MACLAY

WESTERN REGIONAL RESEARCH LABORATORY,
BUREAU OF AGRICULTURAL AND INDUSTRIAL CHEMISTRY,
AGRICULTURAL RESEARCH ADMINISTRATION,
U. S. DEPARTMENT OF AGRICULTURE,
ALBANY, CALIF.

[1] W. E. Baier and C. W. Wilson, *Ind. Eng. Chem.*, 33: 287, 1941.

[2] California Fruit Growers Exchange, Ontario, California.

[3] We express our appreciation to Ruth M. Chesbro, R. O'Neal and C. S. York, Department of Bacteriology, University of California, for their bacteriological testing.

BOOKS RECEIVED

BEAUCHAMP, WILBUR L. and JOHN C. MAYFIELD. *Basic Electricity.* Illustrated. Pp. viii + 312. Scott, Foresman and Co. $1.60.

GEORGE, RUSSELL D. *Minerals and Rocks.* Illustrated. Pp. xviii + 595. Appleton-Century. $6.00.

HART, ALAN L. *These Mysterious Rays.* Illustrated. Pp. x + 218. Harper and Brothers. $2.75.

HEISIG, G. B. *The Theory and Practice of Semimicro Qualitative Analysis.* Pp. xiii + 331. W. B. Saunders Co. $2.50.

JAMES, GLENN and ROBERT C. JAMES. *Mathematics Dictionary.* Illustrated. Pp. viii + 319. The Digest Press. $3.00.

KELLY, FRED C. *The Wright Brothers.* Illustrated. Pp. 340. Harcourt, Brace and Company. $3.50.

MCFARLAN, ARTHUR C. *Geology of Kentucky.* Illustrated. Pp. xxviii + 531. The University of Kentucky.

MIGONE, RAUL C. *Inter-American Statistical Yearbook 1942.* Illustrated. Pp. 1066. Macmillan. $10.00.

MILLAR, C. E. and L. M. TURK. *Fundamentals of Soil Science.* Illustrated. Pp. xi + 462. John Wiley. $3.75.

WILSON, CHARLES MORROW. *Trees and Test Tubes.* The Story of Rubber. Illustrated. Pp. xii + 352. Henry Holt and Co. $3.50.

WULFF, E. V. *An Introduction to Historical Plant Geography.* Illustrated. Pp. xi + 223. Chronica Botanica Co. $4.75.