tumors induced by parasites and chemical irritants, the factors of heredity, age and acquired hypersensitiveness in relation to cancer, the relation between the histology of spontaneous mouse tumors and the genetic constitution of the animals in which they arise, and the genetics of mouse leukemia and various other papers of similar nature will be presented.

The session on induction, stimulation and inhibition of tumorous growth will devote considerable time to the discussion of compounds. As is well known, tremendous activity has been exhibited in this field of late, and this symposium will afford an opportunity of presenting a number of views on this question. The session will be opened by Dr. Louis F. Fieser, of Harvard University, who will discuss the chemical aspects of the carcinogenic substances and the indications which can be drawn from the chemical structures regarding the relationship between carcinogenic action and the sex hormones. This paper will be followed by others on various phases of carcinogenic substances and a number of papers on the relationship of the sex hormones to the cancer problem. At this session will also be given papers on the significance of viruses and of inhibiting substances in connection with tumors.

Thursday morning will be devoted to the consideration of questions closely related to the metabolism of cancerous tissue. The session will be inaugurated by Dr. Warren H. Lewis, Carnegie Institution, who will discuss the cultivation and cytology of cancer cells. This will be followed by a critical analysis by Dr. Dean Burk, of the United States Department of Agriculture, of our present knowledge of the intermediary carbohydrate metabolism of tumors and the significance of the Pasteur-Meyerhof reaction in the light of recent work. The relationship of protein metabolism to malignant growth will be discussed by Dr. Carl Voegtlin, National Institute of Health, while the rôle of the amino acids and the nucleic acid derivatives in developmental growth and their possible significance to the cancer problem will be presented by Dr. Frederick S. Hammett, of the Research Institute of Lankenau Hospital. The session on metabolism will be closed by a discussion of the distribution of inorganic salts in cells and tissues with particular reference to such studies of cancerous cells by the micro-incineration technique.

The two general papers will be given by Dr. C. C. Little, of the Roscoe B. Jackson Memorial Laboratory, and Dr. Walter Schiller, of the University of Vienna. Dr. Little will present a general lecture for not only Section N but for the entire association at 4:30 on Thursday and his subject will be on the social significance of cancer. Dr. Schiller will lecture at 4:30 on Friday afternoon on changes and modifications in the conception of carcinoma. It may also be mentioned that the American Society for the Control of Cancer has been invited by the association to hold an exhibit on various aspects of the social control of cancer.

In addition to the cancer symposium the Medical Sciences Section is planning to hold a joint session with the pharmacy subsection on Monday afternoon and the general session for the presentation of general papers will be held on Friday morning.

The association has been invited to hold the last day of the meetings on Saturday, January 2, at Philadelphia. Accordingly, the Medical Sciences Section plans to hold one session on Saturday morning at 10:30 at the Philosophical Society in Philadelphia and has invited Dr. Wendell Stanley, of the Rockefeller Institute, Princeton, N. J., to give a lecture regarding the interesting and important work that he has been doing on the tobacco mosaic virus which he has succeeded in crystallizing. The afternoon will be devoted to visiting the various medical scientific laboratories in Philadelphia.

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SPECIAL ARTICLES

NITRIFICATION IN PRESENCE OF ORGANIC MATTER

IT is well known that, when cultured in artificial media, the nitrifying organisms, *Nitrosomonas* and *Nitrobacter,* are paralyzed even by very minute quantities of organic matter. On the other hand, nitrification in nature, especially in soil and sewage, proceeds in presence of fairly large quantities of organic matter. This incompatibility of behavior of the classical nitrifying organisms in pure artificial cultures and in their natural environments may be explained as due to one or more of the following:

(1) The nitrifying bacteria function in association with the saprophytes of the soil.[1]

(2) There are in soil several strains of organisms other than the classical nitrifiers which could tolerate fairly large quantities of organic matter and nitrify ammonia.[2]

(3) All nitrifiers are heterotrophic at some stage of their lives.[3]

[1] W. Omeliansky, *Centralb. für Bakt. Abt.*, 2, 5, 473, 1899.

[2] D. W. Cutler and B. K. Mukerji, *Proc. Roy. Soc.*, B 108, 334, 1931.

[3] N. W. Barritt, *Annals Appl. Biol.*, 20: 165, 1933.

No conclusive evidence on these interesting points, however, has so far been available.

Some systematic studies were therefore carried out by the author with cultures of *Nitrosomonas* in an Omeliansky medium to which different forms of soil and other micro-flora were added, both by themselves and in presence of various forms of organic matter. As a result of these, it was found that, although the organic matter tended to depress nitrification when *Nitrosomonas* was present by itself, the adverse effect was completely removed in presence of other organisms. In most cases there was also enhanced nitrification. Fig. 1 will illustrate the type of results obtained.

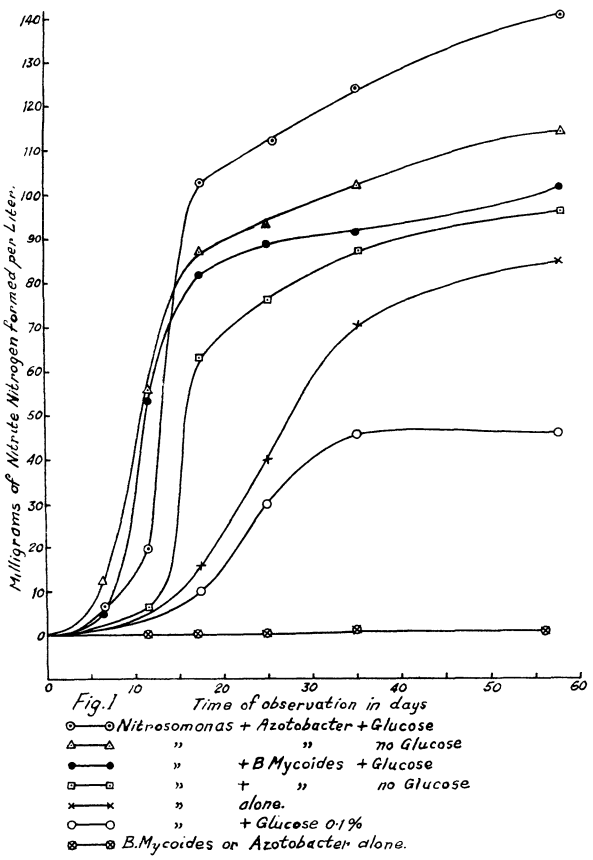

Fig. 1

Exactly similar results were obtained when these experiments were repeated in presence of soil.

These and other observations would show that by utilizing the interfering organic matter in some way, the associated saprophytes assist *Nitrosomonas* in its function. The exact mechanism by which nitrification is stimulated in some of these cases is still obscure. Nevertheless, a correlation is possible between nitrification in pure cultures and that in soil if we assume the occurrence of a regulated *Chemomixotrophic* metabolism for these organisms. Further work on this and related aspects of the problem is in progress and will be reported elsewhere.

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POSSIBILITY OF PARTHENOGENESIS IN GRASS

MANUALS agree quite unanimously that buffalo grass (*Buchloe dactyloides* (*Bulbilis,* Raf.) is dioecious, and that vegetative branches propagate only their own kind—either male or female. Sodded areas are usually and preponderantly of either staminate or pistillate plants only. This fact permits removal of large sods of each sex. Pistillate plants are generally so short that mowing is of small consequence and they have been utilized as a "self-mowing" or lazy man's lawn grass!

Thus far the genus Buchloe has been monotypic with little possibility of mistaken identity except in the vernal or juvenile stages with curly mesquite, *Hilaria belangeri,* a strictly monoecious and perfect-flowered grass which grows only in the southern end of the buffalo grass zone. The famous tree "shelter belt" passes through the heart of the recognized buffalo grass area. Hitchcock[1] says it is "probably the best known range grass—a sod-forming short grass dominant over much of the Great Plains—the foliage cures on the ground and furnishes nutritious feed during the winter. The sod houses of the early settlers were made mostly from the sod of this grass."

Only limited quantities of buffalo grass seed have been harvested because the staminate flower is located so near the soil surface and the seeds are formed below the reach of ordinary harvesting tools. Recently seed has been harvested by means of vacuum suction and by hand picking.

In the spring of 1935 some tall-growing plants were found with elevated pistillate spikelets which if reproduced would make it possible to harvest the seed crop with a mowing machine such as is ordinarily used on the farm, provided the seed would remain attached. Since buffalo grass can be propagated vegetatively the prime utility of this selection might be its hay- and pasture-producing potentiality. Quinby of the Texas station[2] has reported recently 2,423 pounds of buffalo grass hay per acre in comparison with 1,673 pounds of Sudan grass. The first mowing of our own planting produced in the summer of 1936 on four 10,000th acre plats an average rate of 3.08 tons of air dry hay per acre.

When the hay was removed a number of well-devel-

[1] A. S. Hitchcock, Misc. Pub. 200, U. S. D. A. 1935.
[2] B. C. Langley, *Capper's Farmer,* September, 1936.