the meantime, pending completion of the organization of the staff, the Iron and Steel Industrial Research Council will continue to be responsible for the large volume of research which is at present in progress, and the transfer of responsibility for the direction of this will not be made until the new organization is complete with director and headquarters staff. With the liberal financial provision which has been made by the British Iron and Steel Federation for an expenditure up to £250,000 per annum, a considerable expansion in present research activities is expected immediately the requisite personnel becomes available.

DISCUSSION

VARIANTS IN FUNGI: FORMATION, REVERSION AND PREVENTION

AN article by Hansen and Snyder[1] suggests nuclear heterogeneity (heterocaryosis)[2] as the probable cause of losses in ability of *Penicillium notatum* Westling cultures to form penicillin, and suggests remedies. The description of variant strains also applies to variants of *Aspergillus niger* v. Tiegh. obtained through chemical induction by Thom and the writer.[3] Nitrous acid and other compounds were used.[4] Reversion of variants to normal-appearing strains could be brought about by growth on high concentrations of amino acids, particularly lysine. Loss in ability to differentiate was attributed to upsets in the characteristic basal complement of enzymes employed in the utilization of amino acid nitrogen in the normal strain.[5] Inability to differentiate seemed proportional to extent of inability to utilize amino acid nitrogen, particularly hydroxyproline. The culture of *A. niger* employed has proved stable under laboratory conditions for twenty-seven years.

The use of amino acids may prove helpful in recovery of the normal strain of *P. notatum* after variant formation, though in some instances the reversion form is not identical with the initial strain. There is a distinct possibility that a cycle of variant formation and reversion might lead to better penicillin producers for this reason.

Autolyzed cultures of *A. niger* produce variants that seem to be eliminated by culturing at optimum temperature and frequent transfers. The procedure now used to maintain stock cultures in liquid medium includes growth at optimum temperatures until spore formation is well under way and storage in the ice-box at 10° C. until needed.

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[1] H. N. Hansen and W. C. Snyder, SCIENCE, 99: 264, 1944.

[2] H. N. Hansen and R. E. Smith, *Phytopath.*, 22: 953, 1932.

[3] C. Thom and R. A. Steinberg, *Proc. Nat. Acad. Sci.*, 25: 329, 1939.

[4] R. A. Steinberg and C. Thom, *Proc. Nat. Acad. Sci.*, 26: 363, 1940.

[5] R. A. Steinberg and C. Thom, *Jour. Agr. Res.*, 64: 645, 1942.

BACTERIOSTATIC AND FUNGISTATIC ACTION OF SOME ORGANIC CHEMICALS[1]

A RECENT abstract in *Chemical Abstracts*[2] reporting the use of sodium selenite in the isolation of paratyphoid bacilli in feces suggested the publication of some observations made in 1940. While attempting to develop a non-sterile technic for studying sugar absorption and assimilation of higher green plants, it was noted that several organic antiseptic chemicals possessed selective bacteriostatic and fungistatic activity.

The results presented in Table I were obtained in a diamalt agar media. The cultures were inoculated with a composite mixture of those air-borne microorganisms which were capable of growing in a liquid media comprised of inorganic nutrients and 0.25 per cent. glucose. The incubation period to determine the selective inhibitory action of the chemicals was six days at 30° C.

TABLE I

BACTERIOSTATIC AND FUNGISTATIC ACTION OF SOME ORGANIC CHEMICALS

Chemical	Concn. in p.p.m.	Selective inhibitory action	
		Bacteria	Fungi
Anisic acid	150	+	−
Benzoic acid	150	+	−
Chrysoidine Y	60	±	−
Chlorothymol	60	−	+
Hexylresorcinol	80	−	+
Sodium 2, 4, 5 trichlorophenate	10	−	±
8-hydroxy quinoline sulfate	10	−	±
Sodium ortho-phenyl phenate	60	−	±

Note: (+) Indicates inhibitory action.
(−) Indicates no inhibitory action.

The data suggest that some of these chemicals may have possible use in the separation of bacteria and fungi. It will be noted that anisic acid, benzoic acid and possibly chrysoidine Y at the concentrations tested selectively inhibited bacterial growth. Chlorothymol and hexylresorcinol selectively inhibited fungal

[1] Journal Paper No. 161 of the Purdue University Agricultural Experiment Station.

[2] M. A. Gohar. Sodium Selenite as a Bacteriostatic Substance and Its Use in the Isolation of Paratyphoid Bacilli. *J. Trop. Med. Hyg.*, 46: 29–32, 1943. (*Chem. Abst.*, 37: 5995, 1943).