A VORACIOUS STARFISH

GILBERT W. TUCKER, of Sarasota, Fla., recently sent in to the Biological Survey, Department of Agriculture, a starfish (*Luidia clathrata*) picked up on the beach, with the rays 145 mm long from the center of the disk. It had swallowed a sand-dollar or keyhole urchin (*Mellita quinquiesperforata*) 60 mm in diameter, and apparently had died as a result of the operation.

The sand-dollar has been completely digested, but the rigid test, though cracked and partly broken, still retains its shape, so that the starfish seems to have a large circular disk.

Most starfishes are very voracious, eating almost anything they can capture and swallow, especially mollusks, echinoderms and worms, sometimes of surprising size. Those with extensible stomachs feed on large bivalves, such as oysters and mussels, and also on fish that have been disabled, especially those caught in gill nets. But it is seldom that a starfish permits its voracity to overreach itself.

AUSTIN H. CLARK

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ON THE COURAGE OF SCIENTISTS

IN the current number of SCIENCE (April 27), under the caption, "Disgrace of German Science," "A correspondent" asks the question, "Is there no courage left among the men of science . . .?" Well, at least your courageous correspondent, who I infer is also a scientist and, at least, a resident of this country, while basking in the sunshine of American freedom, nevertheless, one observes, finds it very convenient for himself to hide behind a pseudonym.

Of course it has not been so long ago when scholars and even public officials in this country lost their jobs for saying what they thought was right and signing their names thereto, and many of them no doubt are still kept from advancement and recognition for having done no more than that. But those men then were in the minority. Judging, however, from the many articles printed in our "big" magazine and newspapers (whose profit incidentally derives largely from lavish advertisements) your correspondent, in the game of berating our neighbors overseas and obfuscating their issues, has the majority on his side. But if he, so favorably placed, exhibits such a degree of funk what does he expect from his German colleagues who have been broken and torn by economic, political and social upheavals and cyclones without end these two decades past?

"Ah, Consistency, what a jewel thou art!"

CHARLES D. SNYDER

SCIENTIFIC APPARATUS AND LABORATORY METHODS

ENDOSPORE FORMATION BY BACILLUS SUBTILIS IN A SYNTHETIC MEDIUM

A NUMBER of papers have appeared within recent years dealing with the old question of endospore formation by bacteria, but few of the workers have utilized synthetic media as a tool for the study of their respective problems. The absence of sporulation in synthetic media was noted by Williams,[1] who was unable to secure satisfactory spore yields with *Bacillus subtilis* in several simple media of known chemical composition. Tarr,[2] however, succeeded in obtaining good sporulation by several aerobic spore-forming bacteria after seven days' incubation in a medium containing mineral salts with a low percentage of sucrose and of secondary ammonium phosphate.

The use of a simple synthetic medium in which a high percentage of spores will be produced within a short period of incubation is very desirable, particularly in the study of physiological conditions influencing sporulation. The effect of various ion combinations on sporulation, and on the resistance to adverse environmental conditions of the spores produced, can be much more satisfactorily determined when a relatively simple synthetic medium is used than is the case when a complex organic medium is employed as a base. Also, where synthetic media are used the matter of confirmation of results is greatly simplified.

In an effort to derive a medium of simple formula suitable for the production of appreciable sporulation by *Bacillus subtilis* some sixty combinations of nutrients have been tested. In every medium except one, sporulation has been either absent or much belated. The sole satisfactory medium is of the following composition:

K_2HPO_4	.31 per cent.
KH_2PO_4	.08 " "
$MgSO_4$	.02 " "
KCl	.02 " "
asparagine	.5 " "
$(NH_4)H_2PO_4$	.1 " "
levulose	.5 " "

The salts and amino-acid are adjusted to pH 7.2, sterilized, and the levulose in sterile distilled water solution is added under aseptic conditions.

[1] O. B. Williams, *Jour. Inf. Dis.*, 44: 421–465, 1929.
[2] H. L. A. Tarr, *Jour. Hyg.*, 32: 535–543, 1932.