as some time will necessarily elapse between submission of the article for publication and its appearance, the present note is intended to give preliminary information as to the mechanism of action of the Clarase and Taka-Diastase preparations upon penicillin reported previously.

Other diastatic enzyme systems than those of Clarase and Taka-Diastase used in our preliminary studies on penicillin, although derived also from the fungus, *Aspergillus oryzae,* failed completely to show evidence of antipenicillin activity. Subsequent studies revealed that the preparations active against the antibiotic agent contained, in addition to diastase or amylase, certain water-soluble, filtrable substances, which are of bacterial origin and which are responsible in part, if not entirely, for penicillin inactivation. Broth filtrates of pure cultures of many of the organisms isolated from the active enzyme preparations will neutralize the effects of penicillin. These bacteria have been identified as belonging to the gram-positive, spore-forming *B. subtilis* and related groups of organisms.

Therefore, the demonstrated power of Clarase and Taka-Diastase to inactivate penicillin in the sterility test is due to bacterial end products which these preparations contain.

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THE IDENTITY OF CLAVACIN WITH PATULIN

WAKSMAN, Horning and Spencer[1] investigated the antibiotic agent produced by *Aspergillus clavatus* (No. 129) and proposed the name clavacin for this substance. Some time ago we began a study of the production, isolation and chemical properties of clavacin. Dr. Waksman kindly supplied one of us (H.W.A.) with *Aspergillus clavatus* (No. 129) which was grown on a Czapek-Dox medium modified as recommended by Waksman. The active material was extracted from the mold culture with ether. The ether solution was evaporated, leaving a brown gum from which the clavacin was extracted with a small volume of water. The aqueous solution was re-extracted with ether and the clavacin was obtained either by direct crystallization from the concentrated ether solution or after a preliminary purification over a silica gel column. The column was developed with moist ether which removed colored impurities first and then the clavacin. The crude material was readily purified by recrystallization from ether. The following data concerning the pure substance have been obtained: Melting point, 109–10° C; empirical formula, $C_7H_6O_4$; molecular weight (cryoscopic in benzophenone) 151, 157; $C_7H_6O_4$ requires 154); semicarbazone, darkens at 200°, decomposes at 290° C; 2,4-dinitrophenylhydrazone, darkens above 190°, decomposes about 300° C; lactone group indicated by slow reaction with alkali; saponification number 69, 71 (evidently molecule cleaved); Zereiwitinoff determination (in *n*-butyl ether) shows slightly less than one active hydrogen per mole; esterification by the acetic anhydride-pyridine method shows one hydroxyl per molecule. The substance is a neutral compound, darkens and loses activity in the presence of alkali, readily decolorizes alkaline permanganate, does not react with aqueous ferric chloride or Schiff's reagent, and is optically inactive.

At this point in our studies a publication by Raistrick and coworkers[2] appeared describing the substance patulin, an antibacterial agent produced by *Penicillium patulum* Bainier. Patulin has the same physical and chemical properties as clavacin. The 2,4-dinitrophenylhydrazones behave in the same way on heating. In order to extend the comparison the acetyl derivative and phenylhydrazone of clavacin were prepared. They melted at the same temperatures (116–117° and 151–152° C, respectively) as the corresponding derivatives of patulin. These results establish beyond question that patulin and clavacin are identical. The fact that both an *Aspergillus* and a *Penicillium* mold produce the same antibiotic substance and in about the same amount is sufficiently unusual to warrant publication of a brief note at this time. The details will be reported later.

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SCIENTIFIC BOOKS

UNDER A LUCKY STAR

Under a Lucky Star. A Lifetime of Adventure. By ROY CHAPMAN ANDREWS. 300 pp. The Viking Press. New York. 1943.

THE title of this book would seem to imply that fortunate circumstances were the making of Roy Chapman Andrews. But I think nearly all readers, nearly all those who know Andrews and his work will

[1] Waksman, Horning and Spencer, *Jour. Bact.*, 45: 233, 1943.

[2] Raistrick, Birkinshaw, Bracken and Michael, *Lancet*, 245: Part II, 633, 1943.