and phenylalanine together, though not singly; without arginine growth was very slight. The remaining amino acids found to be stimulatory in a fluid medium were omitted without effect from the semisolid agar medium.

The need for heavy inocula to initiate growth in both fluid and semisolid media and our inability to culture the organism serially in the liquid medium suggest additional growth essentials. This is borne out by the fact that washed cells grew better in a fluid peptone medium than in the synthetic medium and by the ability of the organism to grow on serial transfer in the former. The replacement of agar by other substances providing increased surface, such as glass wool, crushed glass, and glass beads, was ineffective in stimulating growth, as was aeration.

MIMA POLYMORPHA IN MENINGITIS

GEORGE G. DE BORD[1]

1425 Manchester Lane, N.W., Washington 11, D. C.

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A perusal of the bacteriological literature shows that the bacteria isolated from the spinal fluid in meningitis in sporadic cases may be classified into three groups: (1) a very high percentage of the pathogenic bacteria, (2) many bacteria that are not ordinarily considered pathogenic, and (3) new species that may or may not bear a resemblance to *Neisseria* or other known bacteria. Within the genus *Neisseria*, smear preparations are not sufficient for identification of the microscopically similar species. Murray (Urol. and Cutaneous Rev., **43**, 739) called attention to the importance of the cultural identification with respect to the meningococcus and the gonococcus and was confirmed later by Carpenter and Charles (Am. J. Pub. Health, **32**, 640). Branham (U. S. Pub. Health Service, Pub. Health Repts., **45**, 845) discovered *Neisseria flavescens* by the cultural method during a localized epidemic of meningitis. Pleomorphism is another factor that can confuse a diagnosis by smear preparations. This has been shown by the author (J. Bact., **38**, 119; Iowa State Coll. J. Sci., **16**, 471; J. Lab. Clin. Med., **28**, 710).

A patient (J. C.) was admitted to the hospital in a comatose condition. In the routine examination of the spinal fluid a gram-negative intracellular diplococcus was isolated that resembled the genus *Neisseria*. Since it was obtained from the spinal fluid, it was assumed for the moment to be *Neisseria intracellularis*. However, the cultural characteristics did not conform to that organism and it was given by Miss Margaret Bush to the author for identification. Further studies showed the organism to be *Mima polymorpha*. Cultures from the spinal fluid yielded this organism during the first week of illness, and during this time micro-

[1] Formerly with the District of Columbia Health Department.

scopic examinations of the spinal fluid continued to show gram-negative diplococci. After the first week, when treatment with sulfonamides had begun, further smears and cultures were negative. This continued to be the case to the time of the patient's discharge from the hospital 10 weeks later. When the patient was last seen a year and a half after his discharge from the hospital, he reported that he had been in excellent health since leaving the hospital.

This culture of *Mima polymorpha* and other members of the tribe *Mimeae* were pathogenic to mice when injected intraperitoneally. Injections were made late in the afternoon and the mice were found dead the next morning. Cultures were taken from the heart blood. Larger doses were used in this work than those used by Deacon (J. Bact., **49**, 511) with guinea pigs. Since the rod form predominates after culture on media for some time, the mouse inoculation method was used to revert the *Mimeae* cultures to the condition in which the majority were diplococcal forms.

Regardless of the source of real or apparent gram-negative diplococci, whether eye, cervix, vagina, spinal fluid, or brain tissue (Deacon), cultural studies must be made for a correct identification of the bacteria.

THE EFFECT OF STREPTOMYCIN ON THE FORMATION OF ADAPTIVE ENZYMES

ROBERT J. FITZGERALD AND FREDERICK BERNHEIM

Department of Physiology and Pharmacology, Duke University Medical School, Durham, North Carolina

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Certain mycobacteria oxidize benzoic acid, and this oxidation is inhibited by streptomycin (Fitzgerald and Bernheim: J. Bact., **54**, 671). Organisms grown on a normal medium exhibit a latent period of 30 to 60 minutes before benzoic acid is oxidized. Organisms grown in benzoic acid subsequently oxidize benzoic acid without this latent period, and much more streptomycin is necessary to inhibit the oxidation. This relative insensitivity to streptomycin was thought to be due to the presence of more benzoic acid oxidase in the organisms grown in, and therefore adapted to, benzoic acid. Recently Stanier (J. Bact., **54**, 339) has shown that benzoic acid and related compounds are oxidized by adaptive enzymes in *Pseudomonas fluorescens*. The adaptation occurs when the compounds are added to nongrowing cell suspensions in the Warburg vessel, and it requires about an hour for the formation of the adaptive enzyme. It seems possible that a similar rapid adaptation occurs in mycobacteria. If this is so, then the inhibition of benzoic acid oxidation by streptomycin may not be due primarily to the inhibition of the benzoic acid oxidase but to the inhibition of the formation of the enzyme. In other words, streptomycin may inhibit the production of an adaptive enzyme.