the routine testing of activity *Mycobacterium phlei* was employed. *Mycobacterium tuberculosis* bovine, human and avian types were inhibited in the media containing 5–10 per cent, *Mycobacterium phlei* in the media containing 1–2 per cent of aspergillin. Two strains of Staphylococci tested were not inhibited. Judging from sub-culture tests, aspergillin seems to be bacteriostatic rather than bactericidal. It is not toxic to experimental animals in large doses and boiling for one hour does not destroy it. The next step is to purify this substance and then to test it as a chemotherapeutic drug against *Mycobacterium tuberculosis*, and to establish the possible relation or difference in the chemical and biological nature of other substances produced by *Aspergillus fumigatus*.

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A Powerful Inhibitory Substance produced by Group *N* Streptococci

IN 1933[1] Whitehead and Riddet, in New Zealand, observed that bulk milk stored overnight in cheese factories sometimes inhibited the growth of the 'starter' culture added to develop the acidity necessary for the cheese-making process.

From the stored milk Whitehead isolated a streptococcus and showed that it produced an inhibitory substance which he considered to be of protein or polypeptide nature[2]. Similar strains have been isolated from milk and starter by others[3,4], and those we have used in our work have been found to fall into Group *N*[5]. The inhibitory substance appeared to be powerful and it occurred to one of us that pathogenic organisms, in particular Group *B* streptococci causing bovine mastitis, might be similarly inhibited.

We have found that many groups of pathogenic streptococci are in fact inhibited even in media containing high proportions of serum or blood. Some species of Bacillus, Clostridium and Lactobacilli are also inhibited but staphylococci so far tested are less susceptible. All Gram-negative organisms so far tested were unaffected.

Since the substance proved to have marked inhibitory properties *in vitro*, preliminary attempts to concentrate it by chemical means were made. A product of high potency was obtained and a serial dilution technique used to assay it.

It completely inhibited the growth of the test organism (*Str. agalactiæ*) in a dilution of 1/640,000, and partial inhibition was observed at 1/1,000,000. The percentage of active substance in this product is, we know, small, so that these dilutions underestimate the activity of the prime inhibitory substance.

Using this impure material in a small preliminary mouse protection experiment, it was found that a single intravenous dose of 2 mgm. following inoculation with about 1,000 lethal doses of a mouse virulent hæmolytic streptococcus had marked therapeutic properties.

A further experiment using twenty control and twenty treated mice was therefore carried out. Each mouse in each group received about 10,000 lethal doses of the streptococcus used in the preliminary experiment, the virulence of which had been raised by animal passage. The untreated control group all died within twenty-four hours. Each mouse in the treated group received, subcutaneously, a total weight of 10 mgm. of the inhibitory substance in three-hourly doses spread over forty-five hours. All the animals were alive and active at the end of this time, when treatment ceased. At the end of seven days from the beginning of the treatment 40 per cent were apparently completely cured. Little or no local or general reaction was observed and toxicity tests with guinea pigs receiving 10 mgm. of the substance in a single dose were completely negative.

The product appears to have certain properties desirable in an inhibitory substance of biological origin. The crude preparation, at least, is heat-stable. The substance is produced in a simple broth medium, and pure culture on a large scale is not difficult. Strains of high potency are easy to select and appear to be stable for months at least.

Even the crude substance is well tolerated on subcutaneous and intravenous injection in distilled water solution. It is dialysable and is therefore a comparatively small molecule. Experiments in purification and application are continuing.

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A Case of Choline Poisoning in Cattle

IN cattle at Kiriat Anavim (Palestine) the following pathological symptoms were observed. After the first calving the uterus did not contract but remained open and atonic for a considerable time, thus forming a source of secondary infections. This condition, which could not be influenced by the usual medical treatment, resulted frequently in inability to conceive and in abortions. No primary infectious disease could be found nor did anatomical or histological examinations of the sexual organs yield any result. The foodstuffs given were the same as employed usually in Palestine dairy farming. They were not deficient in nutrients, minerals and vitamins. The only unusual foodstuffs given were wet brewer's grains, which formed a considerable part of the rations for some years. Infected barley is known to have had detrimental effects in some cases, owing to an excessive content of amines[1], especially free choline[2]. Since normal barley generally does not contain appreciable amounts of free choline, we undertook to compare the brewer's grains with normal barley in respect to their choline contents.

The choline was obtained by extracting the materials with 60 per cent alcohol, and, after evaporation of the alcohol, removing the proteins, salts and other