relatively poor results obtained in the treatment of fibrocaseous tuberculosis with streptomycin alone (*1*), it seemed highly desirable to test the combined effect of potassium iodide and streptomycin against established tuberculosis in guinea pigs.

First of all, it appeared essential to determine *in vitro* any possible effect of KI on the antibiotic potency of streptomycin. This was done by mixing varying concentrations of streptomycin with serial dilutions of potassium iodide ranging from .01 to 1.6 M concentration in infusion broth at 56° and 95° C for 7 min. The antibiotic titer of these mixtures was tested by using a fast-growing strain of tubercle bacillus. No alteration in the potency of the streptomycin was observed when compared with controls after incubation.

In view of these results, four groups of young guinea pigs, varying from 350 to 450 gm in weight, were inoculated in the groin with 1 cc of an aqueous suspension of tubercle bacilli (H37RV) containing 0.30 mg/cc. Seven pigs served as a control group; the other three groups (10 pigs each) were treated, respectively, with potassium iodide alone, with streptomycin alone, and with both streptomycin and potassium iodide. Treatment was begun 21 days after inoculation. The dosage of potassium iodide was calculated on the basis of 80 mg/kg of body weight/day and was given in a weak aqueous solution (16 mg/cc) by stomach tube once daily. The dosage of streptomycin was calculated on the basis of 12,500 μg/kg of body weight/day and was injected intramuscularly at 6-hr intervals. During the course of four weeks treatment, the inguinal nodes in the streptomycin-potassium iodide group remained significantly smaller than those in the other three groups. At the end of four weeks of treatment and the seventh week of infection, all animals were sacrificed and autopsied. On gross examination, the controls and KI guinea pigs showed heavy tuberculous infection of all the viscera, in the streptomycin group five pigs showed spread to the organs, whereas in the streptomycin-KI group the organs were entirely free from infection.

A subsequent survival experiment was run, using young pigs ranging from 350 to 450 gm in weight. This time three groups of guinea pigs were used: 15 in a control group, 15 in a group treated with streptomycin alone, and 16 in a group treated with both streptomycin and potassium iodide. Inoculation with H37RV was carried out in exactly the same manner as in the preceding experiment. Treatment was delayed, however, until the end of the fourth week of infection. The potassium iodide dosage was the same as that used in the first experiment. The streptomycin was increased to three times the former dosage. Treatment was carried on for a period of five weeks and then discontinued. At the end of the twelfth week of infection, 13 of the 15 in the control group were dead, 5 of the 15 in the streptomycin group were dead, and only 1 of the 16 in the streptomycin-KI group had succumbed. At this time two animals in each group were sacrificed and autopsied for the purpose of obtaining microscopic sections from the three groups simultaneously. Results of microscopic studies will be reported in a future communication. Excluding the two pigs sacrificed from each group, the deaths from tuberculosis at the end of the 15th week of infection were: controls, 13 of 13 animals; the streptomycin group, 6 of 13; the streptomycin-KI group, 2 of 14. The respective mortality percentage rates were thus 100%, 46.1%, and 14.3%.

These results offer many interesting possibilities for further investigation. Clinical tests are now in progress.

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Graphite Bearings for Mechanical Stirrers

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Machined graphite bearings placed at strategic points in the mercury seal of a laboratory stirrer permit extremely rapid stirring with a minimum of attention. Graphite can be turned down on an ordinary lathe that is equipped with a chuck or collets. Precision tooling is not necessary. These bearings are machined in such a manner as to allow free movement of the bearing surfaces without permitting the stirrer shaft to wobble. Because of the variations in glass tubing sizes, it is found advantageous to tailor each set of bearings to fit the seal for which they are intended.

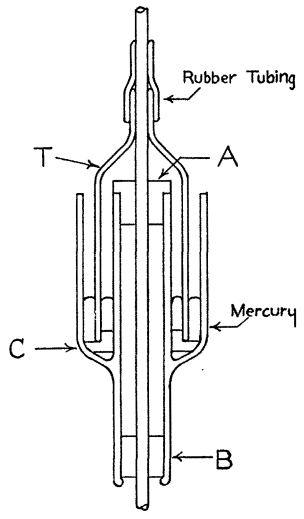

FIG. 1

The cross section of such an assembly (Fig. 1) shows a set of three bearings, which has been found to be the most stable arrangement. Bearings A and B furnish dual bearing surfaces between the stirrer shaft and the inner tube of the mercury seal. Bearing C braces the lower end of tube T, which rotates with the stirrer shaft. The lower end of the inner tube must be slightly constricted by fire polishing to prevent bearing B from fall-

ing out of the seal. The shoulder on bearing A holds it in the top of the inner tube. Bearings A and B are drilled and turned down on the lathe as a single unit and cut with a hack saw.

For ordinary stirring, bearing C can be eliminated. Its purpose is to steady the end of the rotating tube, T, and to check mercury splashing. Use of this bearing is suggested when especially stable setups are desired, very long stirring periods are required, or larger setups are used.

The use of ball bearings, suggested by Hershberg (*1*), facilitates rapid stirring, but the nature of the materials involved in most chemical reactions makes it impractical to install a set of ordinary steel ball bearings inside the seal or flask. The ball bearings must therefore be mounted quite far from the free end of the stirrer shaft. Greater stability can be obtained by supporting the shaft nearer the stirrer end by a graphite bearing such as B.

The problem of splashed mercury finding its way into the reaction vessel is virtually excluded by the presence of bearing A. Bearing B decreases the refluxing of solvents within the seal and makes subsequent cleaning of the seal a much easier task. Other advantages of the graphite bearings are: ease of assembly of the seal, durability, self-lubrication, and chemical inertness of the materials involved.

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Tissue Potassium Determinations[1]

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A simple and relatively rapid method for determination of potassium concentrations of tissue has been developed in our laboratory.

From a series of ether-killed male albino rats of ca. 200-gm weight, brains and gastrocnemius muscles were removed and weighed. Tissues were then placed separately into 100 or 200 cc of distilled water and boiled under reflux condensers for 10 min. Solutions were stoppered and stored at 3° C for 36 hrs.

In the case of brain, sufficient agitation to fragment the tissues usually followed boiling, while in the case of muscle, a clear supernatant fluid was characteristically obtained.

At the end of 36 hrs aliquots taken from the supernatant liquid for potassium determination were analyzed by the flame photometer (Perkin-Elmer Model # 18); the boiled tissues, as a control of the method, were removed, dried at 105° C for 1–2 hrs, and then ashed in a muffle furnace at 550° C for 2 hrs. Tissue ashes were taken up in 0.1 N HCl, transferred through ash-free filter paper (S & S Blue Ribbon) to 50- or 100-cc volumetric flasks, and made up to volume with distilled water.

Analysis of the supernatant liquids of 23 brain and 17 muscle preparations yielded mean values of 3.42 ± 1.08 mg of K/gm of wet brain and 3.96 ± 0.12 mg of K/gm of wet muscle.

Application of Fisher's t test showed that there was no statistically significant difference between the standard errors of the mean potassium content values obtained by this method and the total potassium values determined by photometric analyses of a series of brain and muscle homogenates, P being 0.5 for brain and 0.4 for muscle.

Subsequent analysis of the tissue ash solutions described above, which were prepared at 2–4 times the concentrations of the solutions in which the tissues had been boiled, in a series of 20 experiments showed without exception that no more potassium remained in the boiled tissue than could be found in a corresponding volume of supernatant fluid. At the dilutions employed, this amount is negligible.

The method described above is recommended for total potassium analyses because, in addition to its simplicity and speed, it obviates the necessity of more arduous ashing or homogenizing techniques.

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Duration of Viability of Neurotropic Viruses in an Experimental Plumbing System Contaminated by Back-Siphonage[1]

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The possibility that poliomyelitis and other virus diseases may be spread by contaminated drinking water has been considered by many investigators. Various factors relating to the epidemiology of virus diseases have been studied. Laboratory experiments indicate that the poliomyelitis virus enters the body through the alimentary tract (*5*), and it has been shown that it is excreted in the stools of patients and persons not showing clinical evidence of the disease (*11, 14*). Furthermore, studies reveal that the poliomyelitis (*6*), St. Louis encephalitis, Japanese B (*3, 15*), and infectious hepatitis (*4*) viruses produce infection when given by mouth.

The poliomyelitis virus has been isolated from municipal sewage during epidemics in Europe and the United States (*10, 12, 13, 17*). The safety factor provided against bacteria through chlorination of water does not seem to apply to viruses. These studies and those carried

[1] These studies were supported by a grant from the American Society of Sanitary Engineering.