benzoic, 3,5-dinitrosalicylic, 3,5-diiodo-4-hydroxybenzoic, diphenic, *m*-iodobenzoic, *o*-iodobenzoic, *p*-iodobenzoic, *m*-nitrobenzoic, resorcylic, and salicylic.

Succinic, lactic, malic, and *l*-aspartic acids supported growth for all of the 36 organisms from both genera of bacteria.

Propionic acid was found to support no growth for *Aerobacter* cultures, but 11 of the 18 members of the *Escherichia* organisms showed growth. Of the 7 organisms which did not show growth, 3 gave irregular tests with uric acid (uric-acid-positive) and 1 gave an irregular test with citric acid.

Butyric acid supported no growth for cultures of *Aerobacter*, but showed growth for all but 6 members of *Escherichia*. Of these 6 cultures, 5 were irregular in their reactions with either citric or uric acid.

Acetic acid supported growth for all but 1 of the *Escherichia* cultures and 2 of the *Aerobacter* cultures; mucic and phenylacetic for nearly all of both genera; and malonic for most of the *Aerobacter* and several of the *Escherichia* organisms. Benzoic acid gave a slight growth with several of the *Aerobacter* and 1 of the *Escherichia* organisms. β-Phenyl-α-β-dibromopropionic gave a slight growth with several of the organisms of both types, and benzyl isothiourea and α-aminoisobutyric hydrochloride supported growth for some members of each genus; 4-amino-1,3-dimethylbenzene acetate also supported growth for several cultures of each genus.

Barbituric acid was positive with all but 1 culture of the organisms tested, and dichlorobarbituric and dibromobarbituric were positive for only a few cultures of both types of organisms.

THE PREPARATION OF SILICIC ACID JELLIES FOR THE CULTIVATION OF MICROORGANISMS

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Sometimes it is desirable to have a method for cultivating bacteria or fungi on inorganic gels which contain only added nutrient solutions of known composition. This may be the case, for instance, when one wants to investigate substances which are essential for, or produced by, the microorganisms. Also in some microbiological assay methods (for instance, determinations of vitamins and amino acids) such inorganic gels are useful. As is well known, the widely used agar-agar is an organic material, varying in composition and containing traces of substances which may have an influence on the growth of the microorganisms. A few microorganisms also liquefy agar-agar. Sometimes silicic acid jellies have been prepared of sodium silicate and hydrochloric acid, but the preparations are troublesome.

An earlier article described silica gels, for bacteriological purposes, which were easily prepared from *ortho*-silicic acid tetramethyl ester, $Si(OCH_3)_4$ (Ingel-

man and Jullander: Nature, **156**, 272). Unfortunately this methyl ester is not obtainable in many countries. Therefore, we have now prepared silica gels for the same purpose from *ortho*-silicic acid tetraethyl ester, $Si(OC_2H_5)_4$, which is a common industrial product in, for instance, the United States. This silico compound gives, with water, silicic acid and ethanol. As, however, the ethyl ester is not so easily soluble in water as the methyl ester, the method has to be altered to obtain a firm, coherent, clear gel. We propose the following method:

One volume of $Si(OC_2H_5)_4$ is mixed with 1 volume of alcohol (ethanol). Into this solution is poured 6 volumes of water. The water is added in portions, with thorough mixing. Of course, the proportions can be altered a little to obtain jellies with varying rigidity. As a precaution against air bubbles in the jellies, "boiled out" water may be used. When the water is poured into the solution, there appears a slight turbidity. The mixture is therefore centrifuged until it becomes clear and then poured into tubes, petri dishes, or other suitable vessels. The solution is heated 30 to 40 minutes at 120 C in the autoclave. The solution then becomes a gel, clear as glass. After the heating, the gels must not be cooled too fast because the gel is then apt to crack. Water is poured over the gel and sometimes replaced with new water, so that the remaining ethanol diffuses away from the gel into the water and thus is removed. Then the water is replaced with a suitable nutrient solution and the tubes are left some time so that the nutrient substances diffuse into the gel. If one does not work under sterile conditions, the gels must be kept at a temperature high or low enough to prevent the growth of microorganisms. If the tubes are not sterile, they are then autoclaved in the usual way. The jellies are now ready to be used.

The silicic acid jellies are more apt to dry up than is agar-agar; hence they should be kept in moist air, for example, in a closed jar with some water in the bottom.

In order to test the silica jellies obtained in this way, we cultivated several different microorganisms on them with good results.

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ADVANTAGES OF INCUBATION AT 30 C FOR THE STUDY OF STAPHYLOCOCCI[1]

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Although staphylococcus medium no. 110 (Chapman, J. Bact., **51**, 409) has given excellent results in this laboratory and in many other laboratories, it

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