7-2′-methylthiazolyl-2,2,-trimethine-thiazolocyanine-3,-3″-diiodide, respectively. Until the end of the war, "DDT" was known to Japanese scientists only by name. As soon as the atomic bombs were dropped on Hiroshima and Nagasaki, pathologists and other specialists were sent to the areas from various institutions, particularly Kyoto and Kyushu Imperial Universities, to study effects on the victims. Many necropsies were performed and specimens taken, and, before American personnel arrived, it had been concluded that hypoplastic anemia was the principal cause of deaths occurring some time after the explosions in the case of victims who did not have serious radium burns. It was also concluded that radioactivity in the areas disappeared within several days, although people entering the areas shortly after the explosions became anemic.

In general, Japanese scientists and most of the population show a great desire to develop contacts and friendly relationships with America and to increase American influence in Japan. This attitude is not as naïve as might be assumed by one not realizing the extent to which most of the Japanese people were ignorant of the actual facts about the war and how resentful they now are of the Japanese militarists who forced the country into conflict.—*J. Linsley Gressitt*, Lt. (jg), H(S), USNR (U. S. Naval Medical Research Unit No. 2, Guam, Marianas Islands).

In the Laboratory

A Useful Selective Bactericidal Property of Tergitol-7

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In the course of isolating Streptomyces (Actinomyces) from soil on starch tryptone agar an extremely heat-resistant bacillus was found as a contaminant in the starch used. Only an Arnold sterilizer was conveniently available, and frequently this organism would remain viable after heating for 30 minutes on three successive days. In one case it remained viable after heating for 30 minutes on six successive days.

The work of Baker, Harrison, and Miller (*1*) suggested detergents as a possible means of eliminating the bacillus without inhibiting the growth of Streptomyces. After some preliminary work Tergitol-7 was selected and the following series of tests carried out. The contaminated starch was used in making up starch tryptone agar.

Test 1. Tergitol-7 was added to starch tryptone agar to make final concentrations of 0, 1:60,000, 1:40,000, 1:30,000, and 1:20,000. This was tubed in ¾ in. × 6 in. tubes to a depth of 3½ in. and the tubes sterilized in the Arnold for exactly 30 minutes. At the end of eight days the tubes with 0 concentrations showed abundant surface growth and some growth throughout the entire column of agar. None of the tubes with 1:30,000 or 1:20,000 concentrations showed growth. All the tubes with 1:60,000 showed growth, and five out of six of the 1:40,000 tubes showed limited growth. The sterile tubes containing 1:30,000 and 1:20,000 were melted and poured into Petri dishes. These were streaked with five species of Streptomyces. Normal growth was obtained on all 1:30,000 plates and on all but one of the 1:20,000 plates.

Test 2. A soil suspension to give a final concentration of 1:10,000 was added to five deep tubes of starch tryptone agar and to five tubes of the same containing 1:20,000 Tergitol-7. The tubes were then sterilized for 30 minutes in the Arnold. At the end of eight days all control tubes showed abundant surface growth and some growth at all levels. None of the tubes containing Tergitol-7 showed growth. The sterile tubes containing 1:20,000 Tergitol-7 were poured into Petri dishes and streaked with *Staphylococcus aureus, Penicillium notatum, Penicillium* spp., *Aspergillus niger,* and *A. flavipes.* All these organisms showed characteristic growth.

TABLE 1
TERGITOL-7 CONCENTRATIONS

	0	1:40,000	1:20,000	1:10,000
E. coli	xxx	xxx	xxx	xxx
Staph. aureus	xxx	xxx	xxx	0
B. subtilis	xxx	xxx	xx	0
B. mycoides	xxx	xxx	0	0
B. sp. (heat res.)	xxx	xxx	0	0

Test 3. Tergitol-7 was added to tubes of nutrient broth in concentrations of 0, 1:40,000, 1:20,000, and 1:10,000. These were sterilized in the autoclave at 15 pounds for 20 minutes. They were then infected

with *Escherichia coli, Staph. aureus, Bacillus subtilis, B. mycoides,* and the heat-resistant bacillus mentioned above. Results were as shown in Table 1.

A loopful of broth from the tubes showing no growth was then streaked on nutrient agar slants. No growth was observed on any of them. This test was repeated three times with the same result.

Test 4. Since running the above tests a large number of starch tryptone agar tubes containing 1: 30,000 Tergitol-7 have been sterilized in the Arnold for 30 minutes and allowed to stand at room temperature for at least eight days before using. About 4 per cent of these have shown limited growth.

Summary

Starch tryptone agar containing 1: 20,000 Tergitol-7 was successfully sterilized in the Arnold by one 30-minute heating period. Decreasing the concentration to 1: 30,000 resulted in 4 per cent failures.

A concentration of 1: 20,000 in the cold killed spores of *B. mycoides* and an unidentified heat-resistant bacillus but failed to kill spores of *B. subtilis.*

Concentrations of 1: 30,000 permitted growth after sterilization of all species of Streptomyces which were tested, while concentrations of 1: 20,000 permitted growth of all species but one.

Concentrations of 1: 20,000 did not inhibit the growth of selected species of *Penicillium* and *Aspergillus* or of *Staph. aureus.*

Concentrations as high as 1: 10,000 did not inhibit the growth of *E. coli.*

Reference

1. Baker, Z., Harrison, R. W., and Miller, B. F. *J. exp. Med.*, 1941, **73**, 249–271.

A Method for Continuous Parenteral Administration of Penicillin and Other Drugs

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The rapid systemic elimination of penicillin necessitates frequent and often uncomfortable injections. The method here used eliminates this disadvantage by the use of an inlying, deep subcutaneous needle connected to a syringe with automatic feed.

As shown in Fig. 1, the apparatus consists of two flashlight batteries (in series) connected, through a potentiometer, with two steel (needle) electrodes immersed in an electrolyte (3 per cent KOH). An outlet from the electrolyte bottle connects, through a rubber tube and stopper, with a rubber finger cot inside the syringe. As gas is formed, the finger cot expands, forcing out the contents of the syringe. Adjustment of the potentiometer affords control over the rate of injection. In the model employed, injection rate could be varied from 1 cc. per minute to 1 cc. per hour. To use, penicillin (100,000 units) is dissolved in 20 cc. of normal saline, loaded into the syringe, and the potentiometer adjusted to the desired rate of flow as shown by the improvised Murphy drip (usually 1 or 2 cc. per hour). The original model is compact and in its entirety can be strapped directly

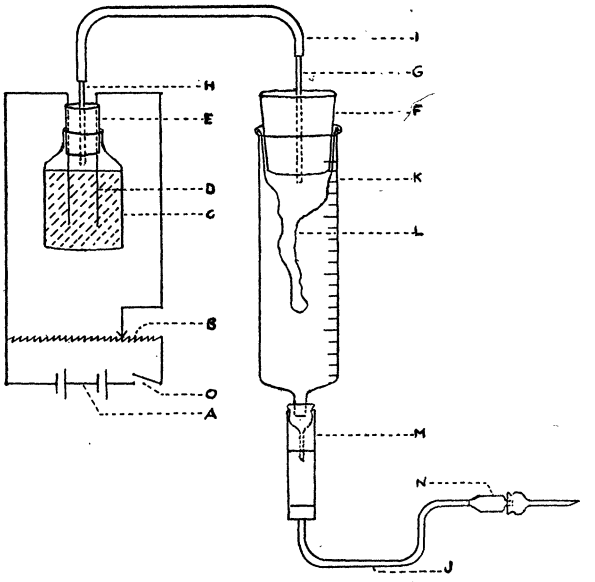

Fig. 1. A—two 1½-volt flashlight dry cells in series; B—25,000-ohm potentiometer; C—small electrolyte bottle of 3 per cent KOH; D—steel needle electrodes; E, F—rubber stoppers; G, H—hollow glass tubes; I, J—small-lumen rubber tubing; K—barrel of 20-cc. syringe; L—rubber finger cot; M—Murphy drip (size 23 needle inside a glass viewing tube); N—subcutaneous needle and adapter; O—switch.

to the leg or to an arm board, allowing relative freedom of movement; however, for more uniform injection elevation of the syringe at least two feet above the level of the patient is preferable. Battery drain is negligible, a single set of dry cells giving over 100 hours of service. The potentiometer should, however, be advanced to the full "on" position every six hours to depolarize the electrodes and prevent slowing up of electrolysis.

Continuous injection over 10- to 12-hour periods occasioned very little discomfort, though there was moderate residual tenderness that soon subsided. Only one reaction was observed, consisting of pronounced local irritation following removal of the needle and apparently caused by too rapid injection. The rate of injection should be slow enough for absorption to occur almost immediately, with minimum subcutaneous collection of fluid. The apparatus is also applicable for constant intravenous injection of penicillin and other drugs.