BACTERICIDAL EFFECT OF THE WAR-TIME PENNY

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The copper penny has long been known to have bactericidal qualities and has been used in the classroom to illustrate such properties, likewise, it has been utilized in small aquaria and reservoirs for the purpose of inhibiting the growth of minute organisms. With the Government's issue of the new war-time penny a study was made to find if this coin produced similar effects and how they compared with those of the copper penny.

Both the copper penny and the war-time penny were placed upon sterile agar in a sterile Petri dish. The plate was exposed to the air for 15 minutes to assure bacterial inoculation. All the dishes remained at room temperatures for the entire experiment. Measurements of the inhibiting zone (Table I) and photographs (Fig. 1) of the plates were recorded at the following intervals: 72 hours, 144 hours, and 240 hours..

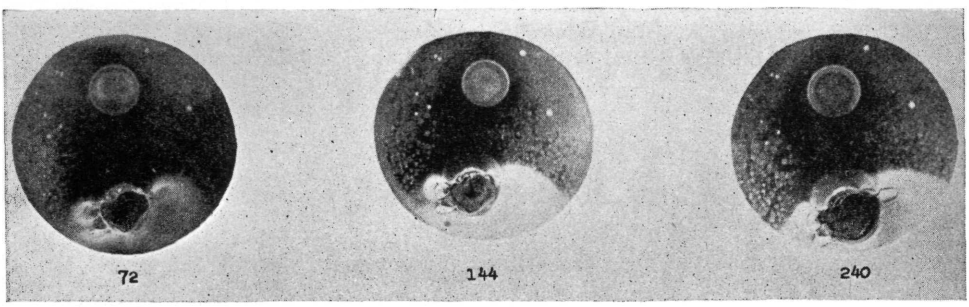

FIG. 1. Photographs of the development of the whitish area at the following intervals: left, 72 hours; center, 144 hours; and right, 240 hours. The copper penny is above and war-time penny below.

Within twenty-four hours after the war-time penny had been placed upon an agar plate a large whitish area formed immediately surrounding the coin (Fig. 1). At first this area was believed to be bacterial growth but because of its color and smooth peripheral edges, suspicion warranted a more detailed examination. One hundred Petri dishes were divided into five groups, twenty in each. They were handled in the following manner: the first group was set up with sterile Petri dishes, sterile pennies and sterile agar; the second group was made up with sterile dishes, sterile pennies and sterile agar, but these plates were streaked with a known bacterium; the third was prepared with sterile dishes, sterile agar and nonsterile pennies; the fourth group was composed of sterile agar, nonsterile dishes and nonsterile pennies and the fifth group, or control group, contained only sterile dishes and sterile agar. Both copper and war-time pennies were used in each of these plates.

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Between 18 and 24 hours after the material had been set up a whitish area appeared around the war-time pennies on all the plates but did not appear around any of the copper pennies. In the majority of plates it appeared before any signs of bacterial growth.

Material was taken from the whitish area of group one and was transferred to agar slants for culturing. No growth appeared on any of the twenty-four slants used. At the same time that the transfers were made, stained smears from the same area were prepared and studied. The smears were found to be free of organisms.

TABLE I

WIDTH OF INHIBITING ZONE

	72 Hours	144 Hours	240 Hours
Copper Penny.....	12 mm.	19 mm.	21 mm.
War-time Penny.....	17 mm.	17 mm.	19 mm.

After 144 hours from the beginning of the experiment an inhibiting zone appeared around the whitish area of the war-time penny. This zone was not large but was clear of bacterial growth and remained so for ten days after the last recorded record. No bacterial colonies were observed on or in the whitish area, the effect seemed to extend in three dimensions.[2] The lack of growth on the slants made from the transfers, the absence of visible organisms in the smears and the production of an inhibiting zone around the whitish area seem to indicate that this whitish area around the war-time penny[3] is a diffusable precipitate or colloid rather than a bacterial growth. The copper penny produced an inhibiting zone that was in diameter 2 mm. larger than the war-time penny.

[2]Nadson, G. A., et C. A. Stern, De l'action a distance des metaux sur les bacteries et les levures. Compt. Rend. Acad. Sci. (Paris) 194 (18): 1597–1600. 1932.

[3]This coin contains steel compounds coated with an alloy of zinc.