CONCLUSIONS

The presence of antigen of *Eberthella typhi* has been demonstrated in the serum of typhoid fever patients early in the disease, and a trace of antigen has been demonstrated during relapse. The test is most strongly positive when the somatic "O" agglutinin titer of the patient's serum is low. The test becomes progressively less positive, and finally negative as the titer approaches 1:640. The precipitin test as described is a useful rapid presumptive test for the diagnosis of typhoid fever in inoculated or noninoculated subjects during the first 7 to 10 days of the disease. A positive test clearly indicates typhoid fever; a negative test does not exclude typhoid or the related enteric fevers.

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REMOVING THE SHELL FROM LIVING GRASSHOPPER EGGS

THE newly laid egg of the grasshopper, *Melanoplus differentialis* (Thomas), is covered with a brown, non-chitinous, semi-opaque chorion or shell. After six or seven days' incubation at 25° C. the embryonic serosa, which lies beneath the chorion, begins to secrete a thick, tough, transparent chitinous cuticle over its entire outer surface. As soon as this new membrane has formed it is possible to remove the chorion and the later stages of development may then be followed easily through the glassy-clear chitinous cuticle. Observations are best made with the eggs immersed in water, using either reflected or transmitted light as desired. Formerly it was necessary to remove the chorion from each egg by hand.[1] This was an extremely tedious process and not always successful.

A short time ago it was found that a 3 per cent. (approx.) solution of sodium hypochlorite will dissolve the chorion rapidly and completely with no apparent effect on later development.[2,3] Two minutes' exposure is usually sufficient to remove the entire shell, while the chitinous cuticle remains unchanged. The eggs are watched under the microscope and as soon as the last of the chorion is gone they are transferred at once to water and washed several times.

Eggs treated in the manner just described develop normally and hatch at the same time as do the controls. A series of experiments, involving about 2,000 eggs, was performed to discover how long a period of exposure could be tolerated. Five minutes in the solution had no noticeable effect, but 10 minutes or more resulted in a definite slowing of development, and hatching occurred later than is usual. Many eggs, however, survived even an hour's treatment, and although all these lagged behind the controls more than 50 per cent. of them finally hatched. Thus it is obvious that two minutes' exposure to the reagent is quite harmless.

Since with this simple method any desired number of eggs may be prepared for study with almost no effort and in the time which it formerly took to remove the shells from two or three its usefulness is apparent.

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QUOTATIONS

RESEARCH[1]

PROGRESS in scientific research and development is an indispensable condition to the future welfare and security of the nation. The events of the past few years are both proof and prophecy of what science can do.

Science in this war has worked through thousands of men and women who labored selflessly and, for the most part, anonymously in the laboratories, pilot plants and proving grounds of the nation.

Through them, science, always pushing forward the frontiers of knowledge, forged the new weapons that shortened the war.

Progress in science can not depend alone upon brilliant inspiration or sudden flights of genius. We have recently had a dramatic demonstration of this truth. In peace and in war, progress comes slowly in small new bits, from the unremitting day-by-day labors of thousands of men and women.

No nation can maintain a position of leadership in the world of to-day unless it develops to the full its scientific and technological resources. No government adequately meets its responsibilities unless it generously and intelligently supports and encourages the

[2] Now in charge of typhus investigation, Egyptian State Serum Institute, Cairo.

[1] From President Truman's message to Congress, September 6, 1945.

[1] E. H. Slifer, *Biol. Zentralbl.*, 52: 223, 1932.

[2] Commercial preparations, such as Clorox and Hilex, are satisfactory and easily obtained.

[3] A solution of sodium hypochlorite (Eau de Labarraque) has long been employed by histologists and embryologists to bleach, clean and soften various tissues and tissue products, but its use as an agent for removing the shell from insect eggs which are to be studied alive seems to be new.