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.

work of science in university, industry and in its own laboratories.

During the war we have learned much about the methods of organizing science, and about the ways of encouraging and supporting its activities.

The development of atomic energy is a clear-cut indication of what can be accomplished by our universities, industry and government working together. Vast scientific fields remain to be conquered in the same way.

In order to derive the full profit in the future from what we have learned, I urge upon the Congress the early adoption of legislation for the establishment of a single Federal research agency which would discharge the following functions:

1. Promote and support fundamental research and development projects in all matters pertaining to the defense and security of the nation.
2. Promote and support research in the basic sciences and in the social sciences.
3. Promote and support research in medicine, public health and allied fields.
4. Provide financial assistance in the form of scholarships and grants for young men and women of proved scientific ability.
5. Coordinate and control diverse scientific activities now conducted by the several departments and agencies of the Federal Government.
6. Make fully, freely and publicly available to commerce, industry, agriculture and academic institutions the fruits of research financed by Federal funds.

Scientific knowledge and scientific research are a complex and interrelated structure. Technological advances in one field may have great significance for another apparently unrelated. Accordingly, I urge upon the Congress the desirability of centralizing these functions in a single agency.

Although science can be coordinated and encouraged, it can not be dictated to or regimented. Science can not progress unless founded on the free intelligence of the scientist. I stress the fact that the Federal Research Agency here proposed should in no way impair that freedom.

Even if the Congress promptly adopts the legislation I have recommended, some months must elapse before the newly established agency could commence its operations. To fill what I hope will be only a temporary gap, I have asked the Office of Scientific Research and Development and the Research Board for National Security to continue their work.

Our economic and industrial strength, the physical well-being of our people, the achievement of full employment and full production, the future of our security and the preservation of our principles will be determined by the extent to which we give full and sincere support to the works of science.

It is with these works that we can build the highroads to the future.

DISCUSSION

THE PROGRESS OF SOVIET PALEOBOTANY

THERE has been a rapid development of paleobotany in the USSR during the past twenty-five years in connection with the extensive geological survey that has covered the entire country. The work done by paleobotanists has helped explain the origin and development of plant life and has provided a basis for the theories of botanists and geographers; it has also helped support the theories of Darwin, which are the main basis of all evolutionary teaching.

During this period paleobotanists have achieved good results in various parts of the USSR; Lower Devonian floras have been discovered in Siberia (*Leptophelum, Asteroxylum, Aneurophyllum, Duisbergia protolepidium, Orestovia* and *Poetria*); in the Timan Mountains we have found Archeopteris, while Permian floras were found on the River Pechora, in the Paichoi Mountains and in the Caucasus Mountains.

Important papers have been published on the Carboniferous floras of the Donets and Kuznetsk coal basins.

Triassic floras have been found at Vladivostok (Pleuromeja), in Bashkiria and in Armenia. The remains of a Greenland flora (Furbula) have been found in the Urals.

Jurassic floras have been described in many parts of the Soviet Union; the Jurassic age of the shales of the main Caucasian chain, in the district near Chkalov (formerly Orenburg), on the River Embe, in Samarskaya Luka, at Orsk, in the Crimea and in the Pamirs has been established; rich floras found in the Irkutsk basin in the Transbaikal region, in the Amur basin (River Bureya) have been described. A number of papers have also been published on the Jurassic flora of Central Asia.

Some valuable discoveries were made in studying the plants in the Cretaceous deposits of various parts of the Soviet Union—in Kamchatka, Northeastern Asia, Central Asia and the Caucasus. These discoveries have helped explain the origin of the modern angiosperms.

The study of Tertiary floras throughout the Soviet Union has produced still more important results. This study has been made throughout the whole territory from the Pacific Ocean to the western frontiers