So, again, it has been with the development of explosives. Recently we have heard much of "T. N. T." and its power has been tragically revealed by the desolation of Halifax. But "T. N. T." was not discovered during the war or because of the war or for any warlike purpose. Trinitrotoluol has long been known and its explosive properties have been known for a like period, and they were discovered in the course of the natural development of the science of organic chemistry. Why, then, do we hear of it only now? Well, just as in Archimedes's day, the present crisis forced us to the immediate utilization of previously accumulated knowledge. A new explosive, of great power and inexpensive to manufacture, was needed. We consulted our hand-books and monographs in which the discoveries of decades are enumerated. In such encyclopaedic works as Beilstein's "Handbuch der Organischen Chemie" which, significantly enough, although written in Russia was published in Germany, we may find hundreds or even thousands of explosive substances enumerated. Amongst those which combined the qualifications of cheapness and power Trinitrotoluol was conspicuous and hence "T. N. T." came into being.

The development of military hygiene has constituted one of the most remarkable triumphs of applied science in the war. Yet here again for the most part we are gathering interest upon past intellectual investments rather than making new investments.

One of the many tragic surprises of the early weeks of war was the sudden appearance of an apparently new disease. "Gas-gangrene was one of the terrors of the doctors at this time. It was a new and totally unexpected complication of the wounds and at first we did not know what to do in the face of this pressing danger."* A man wold receive an apparently trivial flesh-wound of the arm or leg, one which in the normal course of events should have healed without difficulty or subsequent inconvenience to the patient. Instead, the whole limb would very quickly become gangrenous and die, with a peculiar type of gangrene which develops gas which one can feel crackling like tissue paper when the fingers are pressed upon the skin. "The general condition of the patients required great care, for they were all very, very ill."

Thousands died from this strange disease alone in the first months of the war. To-day this type of wound infection is no longer a vitally important complication, for we now have it under control. Even this advance in medical technique, however, was not accomplished within the battlezone and owes but little to the war.

In a dressing-station, a clearinghospital, or even in a base-hospital but little creative scientific investigation can be done. While hundreds of shattered or tortured men are pouring in upon the doctors and nurses, while the very simplest comforts and methods of relief are the crying need and lives hang upon the speed with which they are provided, it is impossible to stay one's hand in order to inaugurate the leisurely investigation which is a necessary prerequisite to the identification of a new bacillus or the invention of new means to combat it. The "surgeons in khaki" did not even attempt it. Instead, precise descriptions of the cases. and what was far more important. cultures of the organisms found in the gangrenous tissues were sent to quiet centers of research far from the thunder of guns and the cries of tortured men, to Paris, London, New York, Boston and Baltimore.

The cultures were received, the symptoms in men and animals noted and the characteristics of the infecting organism reviewed in a dozen laboratories. Then the investigators in these laboratories turned to their libraries, to the reference-books, the

* A. A. Martin, "A Surgeon in Khaki". (London, 1916).