

or have not taken time to look at the various preparations of the exhibit and profit by the possible short-comings that have been evidenced thereby.

"I would move, Mr. Secretary, that a rising vote of thanks be extended to the Chairm for the excellent work he has done in this section."

SECRETARY THUM:—"A motion has been made and seconded that a vote of thanks be extended to Chairman Cook for the excellent work he has performed in this section. All in favor of this motion will please rise."

(Unanimously carried.)

CHAIRMAN COOK:—"Thank you, gentlemen. I am sure that the success of this section has depended upon the splendid coöperation of about fifty members of the A. Ph. A., and thanks are due them.

"If there is no special preparation you wish to discuss, a motion to adjourn will be in order."

DR. WILBERT:—"I make the motion, Mr. Chairman."

Motion carried.

HIGH EXPLOSIVES IN WARFARE.

The high explosives being used for artillery shells in the war constitute the subject of an interesting article in *Nature*. For military purposes explosives of the nitro-glycerin class and many others are excluded, because the military high explosive must be sufficiently insensitive to shock to prevent its being exploded when struck by projectiles or when submitted to the shock of being fired from a gun as the charge of shell. Gun-cotton, containing a considerable amount of moisture, was formerly used for many years. This provided an excellent and safe explosive for military mines and purposes of destruction and as a charge for torpedoes, but was not suited for use in shells. The high explosives chiefly being used for shell-firing at present are picric acid, trinitrotoluol, and ammonal. Picric acid, which superseded black gunpowder, has been in use in most countries under the names of melinite, lyddite, shimose powder, etc. But, although sufficiently insensitive to shock, it has the disadvantage of readily attacking metals and forming picrates, which are much more sensitive and liable to explosion. Ammonal is a mixture of ammonium nitrate, trinitrotoluol, charcoal, and aluminum in fine powder. It is safer and more powerful than picric acid, but needs to be very carefully guarded from moisture on account of the hygroscopic character of ammonium nitrate. Trinitrotoluol, known under the names of Trotyl, Tritolo, Tolite, Tritol, Trilite, and T.N.T., is the most widely used military high explosive. It is less sensitive to shock than picric acid, is chemically stable and unaffected by water and metals, and can be fused and run into shells in the molten state. Hard blocks of suitable size and shape are covered by electroplating them with copper, to prevent their being broken or chipped. The destructive effect of an explosion is caused by the almost instantaneous conversion of the solid explosive into gases at a very high temperature, with the consequent sudden exertion of an enormous pressure. In addition, where the explosion takes place in a closed space, the resulting gases, especially carbon dioxide, may have poisonous effects on anyone having to breathe them.