

Heat of Body Detected 600 Feet Away

ALTHO you do not know perhaps, or at least may not have stooped to think about it, one of Uncle Sam's military experts can spot you in the dark, and tell in what direction you are moving—and at a distance of 600 feet—all due to the fact that your body radiates HEAT! Not very much, it is true—but still enough to affect a sensitive electric thermopile of the type shown in the accompanying illustration.

A recent issue of the *Physical Review* contains a summary of a paper read by Mr. S. O. Hofman at the Washington meeting of the *American Physical Society* on this extremely interesting subject. In trench warfare operations on the Western front, maneuvers took place mainly in the night time, as any movement during the day quickly attracted hostile rifle and artillery fire.

An attempt was made, therefore, to detect the presence of men moving in "No-Man's-Land" at night by recording or indicating the heat radiated from their bodies. The receiver utilized a delicate heat-actuated instrument or heat indicator for this purpose, comprising an electric thermopile placed or mounted on the focus of a 14-inch parabolic mirror. This thermopile, which generates a very minute yet measurable electric current whenever a heat ray, even the ever so slight, impinges on it, is connected to an extremely sensitive

electric galvanometer or magnetic needle instrument of the D'Arsonval type.

Remarkable and uncanny as it may seem, it was actually found possible with this sensitive apparatus to detect the presence of a man at a distance of 600 feet or over one-eighth of a mile away, which gave plenty of time in most cases to organize a counter-attacking party, or extra guard.

This device proved very useful for detecting hostile raiding parties creeping towards the trenches in the darkness of night, and helped in many cases to capture some badly wanted enemy prisoners for the purpose of questioning by the intelligence officers, especially when an attack was about to be made by the Allied troops.

One of the accompanying illustrations shows an effective and sensitive form of thermopile. The minute electric current generated at the juncture of two dissimilar metals such as copper and iron, or antimony and bismuth, when heated by the impinging of a heat ray upon the juncture, will cause a deflection on a sensitive galvanometer connected to the opposite terminals of the thermopile.

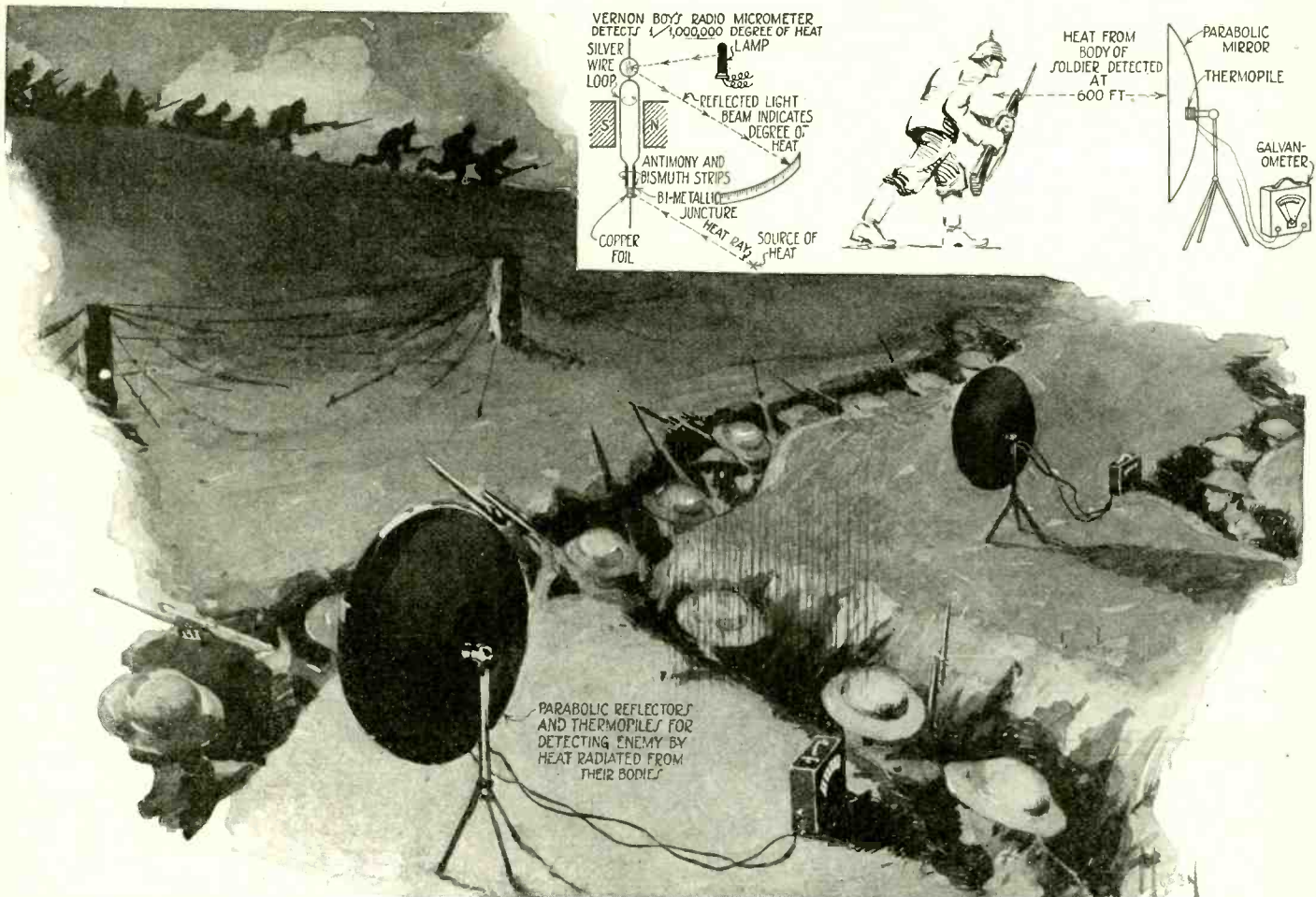
Altho it is but little known, thermopiles so sensitive that they will record the heat radiated by distant stars have been devised and regularly employed in astronomy work by those engaged in this work.

Dr. W. W. Coblentz, of the U. S. Bureau of Standards, has devised an extremely

sensitive thermopile for this work, and this is built in an evacuated glass tube. On this measuring instrument are registered infinitesimal fluctuations of temperature.

A ray of light may have started ten years ago from some distant star, and may have spent all of these ten years hurtling earthward-bound thru space at a speed so astounding that it could girdle the globe in far less time than it takes to blink an eye—and yet when it falls upon the bolometers at the Bureau of Standards they will tell the observer how much heat that ray brought with it from the star to the earth!

As Silvanus Thompson points out, one of the most remarkable instruments of this type is the radio-micrometer devised by Vernon Boys. On this instrument a loop of fine silver wire is suspended by a quartz fiber between the poles of a magnet, and this loop of silver wire has its circuit closed at its lower end by a piece of antimony and a piece of bismuth (or alloys of these metals) soldered to a minute disc of copper foil. A rise of temperature in the copper foil, even so small as one-millionth of a heat degree, will generate an electric current in the loop and give a deflection over one division of the scale on the instrument. With a heat detecting instrument of this type the radiant heat of a candle can be detected at a distance of two miles, as Silvanus Thompson shows.



Imagine That You are a Soldier in the Dark At Night, and That You are Attempting to Raid the Enemy Trench. Likewise, Imagine That You are At a Distance of Nearly One-quarter of a Mile from Said Trench. If It is Pitch Dark, You Will Feel Very Confident in the Dark, That You Can Sneak Up On the Enemy Without Exciting the Least Suspicion On His Part,—But Foiled Again!—for It Now Develops, That the Electrical Experts of the Allied Military Engineers Had Developed and Utilized a Super-sensitive Electric Thermopile, Which Will Detect the Heat Radiated from the Human Body, At a Distance of from 600 to 1,000 Feet, and Many a Dead German Soldier Would Tell You the Answer, If He Could!