The full report (Serial No. 2386) on comminuted smokeless powder and its usefulness as a blasting agent may be obtained from the Director, U. S. Bureau of Mines.

TELLURIUM.

By H. A. Doerner.

FROM its chemical nature, tellurium is now known to be a non-metallic element belonging to the sulphur-oxygen group. It is most popularly known through its occurrence in certain gold ores—tellurides—which have been extensively mined in the Cripple Creek mining district, Colorado.

Tellurium is a silver-white solid with metallic lustre, the crystalline form being very brittle and easily powdered. It has a specific gravity of 6.27, melts at 452° C. and boils at red heat, giving off a golden-yellow vapor when air is excluded. When heated in air, tellurium burns with a blue flame tinged with green, and evolves white vapors of tellurium dioxide. An amorphous form of tellurium, obtained by reduction and precipitation from solution, has a specific gravity of 6.015, and when heated is changed to the crystalline variety. Tellurium is insoluble in water, carbon disulphide or hydrochloric acids, but it is dissolved by nitric acid or concentrated sulphuric acid. It does not tarnish in moist air, is resistant to alkaline solutions, except concentrated KOH, but it is dissolved by fused alkalis. Its atomic weight has been the subject of much controversy, but the value 127.5 has been generally accepted. The chemistry of tellurium is similar to that of sulphur. It forms three oxides: TeO , TeO_2 , and TeO_3 ; also tellurides, tellurites, and tellurates. A number of halide compounds, a sulphide, and a sulphate are known.

The Bureau of Mines has compiled a brief report (Serial No. 2385) containing a summary of the known facts regarding tellurium, and reference to the published sources of information on the element.

FAILURE OF CENTRE SHOTS IN BLASTING.

By L. C. Ilsley, Electrical Engineer, and A. B. Hooker,
Assistant Electrical Engineer.

IN blasting on a large scale with a blasting machine, trouble has been experienced with missed shots. The shots that fail to

fire are often a group in the centre of the series. The Bureau of Mines has conducted field and laboratory tests to ascertain the cause and remedy of the difficulty. The results of the tests showed that if a large number of the common electric detonators are connected in series and fired where the earth is wet, a large leakage of firing current occurs, and the detonators at each end of the series circuit may fire, whereas the middle ones misfire. The detonators near the positive end fire because too little leakage has occurred to cause a misfire; those near the negative end will fire because enough current has returned to the circuit. The middle detonators misfire because the current is not sufficient to fire them before the firing of the end detonators has opened the circuit. The writers make recommendations as to the elimination of the misfiring of the centre shots. This report has been issued by the Bureau of Mines as Serial No. 2384, Reports of Investigations, which is available for distribution.

A Continuous Spectrum from Mercury Vapor. C. D. CHILD. (*Astrophys. J.*, May, 1922.)—From 1890 onward it has been known that mercury vapor can be made to emit a continuous spectrum. The conditions for such an effect are now described for the first time. They are three in number. The current density must be small, the temperature of the vapor must be above 120° C. and below a higher temperature depending on the density of the vapor, and, lastly, the vapor must have a density about the same as that of saturated vapor at 120° C. The best source of current for getting the continuous spectrum is a Wimshurst or Toepler-Holtz machine.

The metallic vapor that gives the continuous spectrum is not just the same as mercury vapor at room temperature, for it emits visible radiation without being ionized and, besides this, it has a lower ionizing potential.

“The carriers of the continuous spectrum are molecules of mercury while the atoms are the carriers of the line spectrum” is the opinion of the author. G. F. S.

From Zurich comes the announcement of the discovery of a new radioactive body. Piccard and Stahel have isolated it and given it the preliminary name UV. It takes 48 days to complete its half change into something else. It belongs in the actinium series. (*Physikal. Zeit.*, Jan. 1, 1922.) Four months later Otto Hahn publishes the results of his investigations, which he interprets as making the existence of UV impossible. No doubt the two Swiss savants will now proceed to do their utmost to establish the existence of their intellectual progeny, and the conflict of evidence will continue until the truth is known and recognized. G. F. S.