

numerous scientific journals of to-day. We look forward to the time when the *Annual Record of Science* will become a standard work absolutely indispensable to all libraries, both public and private, at home and abroad.

W. F. B.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.]

Heat of the Comstock Mine

I NOTICE in NATURE, vol. xx, p. 168, that Dr. Lesley quotes from Prof. Barker an opinion in regard to the heat of the Comstock Mines in Nevada. Referring to my assertion that the heat of the rock "is pretty uniform" in the lower levels, Prof. Barker announces that there are "the most remarkable differences, some of the higher levels being much hotter than some of the lower levels." This is perfectly true, and the fact is no disproof of my assertion. In the article to which Dr. Lesley refers (*Silliman's Journal*, April, 1879) I said that there are striking differences of temperature in the rock, and endeavoured to explain them by showing that there is a great mass of rock which may be regarded as heated to a tolerably uniform degree at all points in the length of the lode, on any given level, and that in this general mass there are isolated localities, most of which show a temperature above that of the rock at large, but some of them below it. I pointed out the conditions under which these local maxima occur, and gave the explanation to which I thought they led. The hot spots are evidently narrow and long, and as the mine openings sometimes intersect and sometimes follow them for some distance, a given level will be for a part of its length in a hot belt and for a part in the general mass of heated rock, or one level may be in a hot belt and show a much higher temperature than the level below, which entirely escapes the exceptionally hot ground. In this way thermometric variations are obtained between different levels and between different parts of the same levels, and these facts were all brought out in my article.

I should not trouble you with this explanation did I not feel that the Comstock lode bids fair to become a classic field for the discussion of terrestrial temperatures. Mr. Clarence King is now on the ground, and will, no doubt, make its unrivalled heat phenomena the subject of careful examination, and everything that bears upon the question has importance.

Dr. Lesley expresses some doubt upon the mechanical theory of earth-heat which was one of Prof. Barker's two conclusions upon the source of the heat. The Comstock is certainly good ground to test this question, for I have never witnessed such constant and general movement of the rocks in any other mines. Still, I do not share Prof. Barker's opinion on this, or on his other point, "that the heat is a hot-water heat." No mining engineer would pronounce the Comstock a wet lode. It discharges four and a half million tons of water yearly, and yet out of the more than twelve miles of linear excavation made every year, I do not believe that 1,000 feet are in ordinarily wet ground. It is a dry lode for the greater part, and in writing upon the subject my efforts have been directed to seeking an explanation for the extraordinary temperature of this dry rock.

JOHN A. CHURCH

115, Broadway, New York, September 8

Crossley's Modification of Hughes's Microphone

EVER since Hughes's discovery of those principles which led to his invention of the microphone, inventors have been trying to improve the instrument by adopting every variety of form and employing every combination of apparatus that were likely to lead to good results. The failures must have been legion, and of the successes the members of the British Association have had during their stay at Sheffield, an opportunity of examining and seeing at work perhaps the most efficient—Crossley's modification of the microphone. Six distant places—the two news-

paper offices and four meeting-rooms—were telegraphically connected with the Cutlers' Hall, where a switch-board stood to place any two distant stations into communication, thus illustrat-

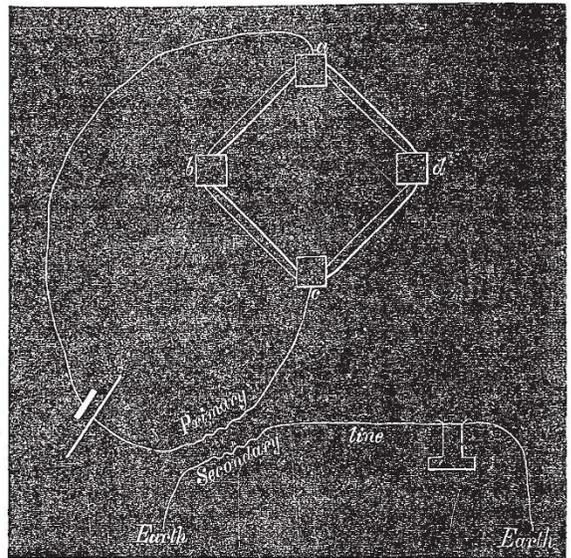


FIG. 1.

ing the exchange system so largely employed in America. Every one is aware that with the telephone the speaker has to hold the

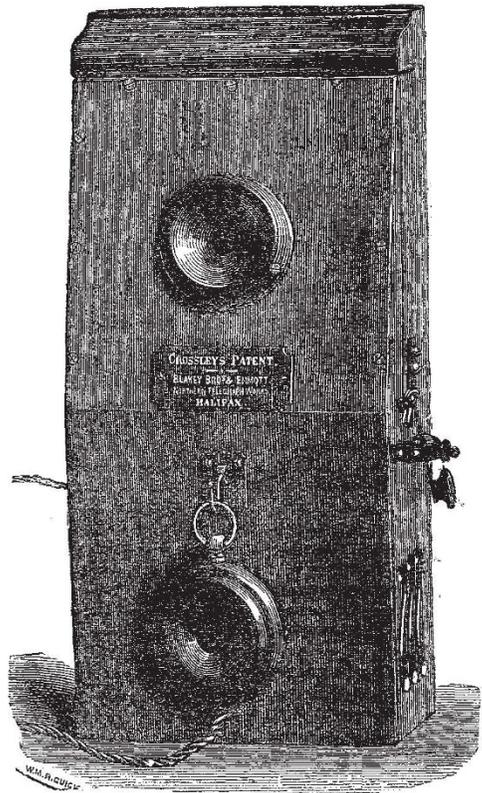


FIG. 2.

instrument to his mouth; with the Crossley's transmitter, however, conversation, a few feet away, is readily conveyed. The transmitter is now being largely employed in the United King-