

conductor, as applied to the earth in relation to battery currents, is a misnomer. The popular theory is, that if the two poles of a battery be put to earth, at no matter what distance apart—be it but one foot or one thousand miles—that the current flows over the wire from the copper pole of the battery to the earth back through the earth, coming up at the zinc pole through the earth, thus completing the circuit. This is not, however, what actually takes place, as the current which leaves the line at the earth, on the copper side of the battery, is taken into the common stock of electricity (of which the earth is a vast reservoir) at that point, and that the current taken up at the earth plate, on the zinc side of the battery, is in like manner derived.

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ART. LXVI.—*Notes on a Paper "On Sinking Funds," read by Captain Hutton before the Auckland Institute, September 7, 1868.* (Trans. N. Z. Inst., Vol. ii., p. 236.) By J. S. WEBBE.

(ABSTRACT.)

[Read before the Otago Institute.]

THE object of Captain Hutton's paper is to discover, by mathematical investigation, whether it is better to invest a sinking fund in the loan which it is intended to pay off, or in other securities. A man of business would not take much time to answer so simple a question. It is quite unnecessary to go to the trouble of calculation to discover—what Captain Hutton has done at the end of his paper—that it is profitable to borrow at a low rate of interest and lend at a high one, and that the longer the time this is done the greater will be the profit; for that is precisely what he means when he says that, "the smaller the sinking fund and the higher the rate of interest, the greater will be the saving effected."

On the main question raised by Captain Hutton, it may suffice to remark that the great advantage of using a sinking fund to buy in an annual instalment of the loan to which it belongs, lies in the certainty of securing its fructification at the same rate of interest as the State is paying for that loan. It is, therefore, matter for congratulation that the safer plan has been adopted in the case of the "Consolidated Loan Act, 1867."

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[ERRATA in *Captain Hutton's paper*, Vol. ii. of the "*Transactions*."]

Page 237, line 1, for "brought" read "bought."

„ 237, „ 26, for "log p v" read "— log p v."

„ 238, „ 14, for "T 1" read "T — 1."—ED.]

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