Lehmann's; the two perhaps had the same number-habit. Does Professor Titchener seriously think that a number-habit in a guesser can account for the amount of coincidence between the numbers which he guesses and those upon counters drawn at random out of a bag?

Even in anti-telepathic Science accuracy of representation is required, and I am pleading not for telepathy, but only for accuracy.

WILLIAM JAMES.

ON THE WEHNELT CURRENT BREAKER.

TO THE EDITOR OF SCIENCE: The following facts, noticed while experimenting with the Wehnelt electrolytic current breaker, may be not without interest:

In order to test if the action of the breaker could be due to a spheriodal state, produced by the high temperature of the positive electrode, some means for measuring the temperature of this electrode had to be obtained. For this purpose I used electrodes of fusible metals melting at different temperatures, the temperature of the electrode being necessarily less than that at which the alloy melts, if the latter remain unfused. In this way one can at least obtain the superior limit for the temperature of the electrode. Starting with a fusible alloy which melted at about 78° C., the electrode melted as soon as the circuit was closed. The next metal used melted at 96° C., and was fused an appreciable, though very short, time after the current was established. Finally, using an anode made of a metal which melted at 168° C., no indication of fusion of the electrode could be detected, even after the breaker had run for ten minutes at a time. This seems to show that the temperature of the electrode was far below 200°, the temperature necessary, at atmospheric pressure, for the production of the spheroidal state.

The influence of self-induction on the action of the breaker was also studied, to some extent. Diminution of the self-induction in circuit diminishes the period of the action, as is shown by the heightened pitch of the sound produced. But absence of all self-induction prevents wholly the working of the breaker. The cell was used in a circuit composed of a storage battery, non-inductive electrolytic resistances and wires wound non-inductively. With this arrangement no interruption of the current could be produced, though the electromotive force was raised to thirty volts and the current to eighteen amperes. As soon, however, as a coil with self-induction was put in the circuit the action of the breaker recommenced. Induction in the circuit is essential to the action of this form of interrupter.

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THERMODYNAMIC ACTION OF 'STEAM-GAS.'

ONE of the most valuable papers recently published in the fields of applied science is that which has just been reprinted from the *Revue de Mécanique* of the last year, the work of Professor Sinigagalia, a well-known author in that field.*

This is the latest and, in many respects, the most complete discussion of a supremely important subject; one to which the minds of men of science and engineers the world over are now again turning after a period of many years, during which the thermodynamic promise of gain in efficiency in the steam-engine through the conversion of a vapor into a gas by this process of superheating had been almost universally believed to be more than counterbalanced by the very serious difficulties met in the earlier days in the attempt to profit by it. Changes have taken place during the last generation which are now thought by many authorities to have largely reduced the obstructions formerly seemingly fatal to a great thermodynamic advance.

In the practical thermodynamic operation of the steam-engine, as M. Bertrand has remarked, there is no such thing as 'saturated vapor,' as that term is customarily employed by the thermodynamists. The working fluid is always, in fact, a mixture of vapor and its liquid, in a

*Application de la Surchauffe aux Machines à Vapeur par M. François Sinigaglia, Professeur agrégé des Ingénieurs de Naples; Ingénieur-Directeur de l'Association des Propriétaires d'Appareils à Vapeur dans les Province napolitaines. Extrait de la *Revue de Mécanique* (1897–98); Paris, V've Ch. Dunod, Éditeur, 1898.