

cohol in chloroform distills without change at 54° approximately, under a pressure of 770.2 mm. of mercury.

IV. A solution containing 12–13 % methyl alcohol in acetone distills without change at 55.9°, under a pressure of 764.8 mm. of mercury. The boiling point of this mixture is about 0.8° below that of the constituent which is present in greatest amount.

V. A solution containing 15–20 % of carbon tetra-chloride in acetone distills without change at a temperature but 0.05° below that of the pure acetone, and all mixtures containing more than 40 % acetone boil within one degree of the boiling point.

VI. The close proximity of the boiling points of the constituents appears to be a favorable condition for the existence of a maximum or minimum point on the boiling-point curve.

VII. In general one constituent remaining the same, mixtures with substances of similar chemical constitution yield similar boiling-point curves.

The second paper was read by Dr. F. K. Cameron, and was entitled 'Boiling Points of Mixtures.'

Dr. H. C. Bolton read an interesting paper on 'The Development of Pneumatic Chemistry,' which was profusely illustrated with lantern slides.

WILLIAM H. KRUG,
Secretary.

GEOLOGICAL CONFERENCE AND STUDENTS' CLUB OF HARVARD UNIVERSITY.

Students' Geological Club, April 11, 1899.—Mr. L. La. Forge reviewed Gregory's 'Plan of the Earth,' indicating several questionable steps in that writer's recent exposition of the subject. Mr. A. W. G. Wilson described a unique lake in Ontario, which is known as Lake-on-the-Mountain.

Geological Conference, April 28, 1899.—Mr. R. E. Burke communicated 'The Discovery of Fossils in the Roxbury Conglomerate,' and will publish on it at an early date.

Under the title 'Mineral Veins of the Mystic Quarries, Somerville,' Mr. R. B. Earle reported the results of his studies in that field. The veins, which are almost entirely limited to

a dike and a sill, are composed chiefly of calcite, but include small amounts of quartz, pyrite and prehnite. The speaker divided the fissures which these veins fill into five classes according to their origin, which he believed to have been by contraction of the molten magma, by earthquakes, by torsion, by faulting or by decomposition. The growth and enlargement of these fissures, when once formed, was held to be mainly due to the expansive force of the vein-filling substance.

Mr. G. C. Curtis exhibited a topographic model, which he has constructed, of an area located in the eastern foothills of the Cascade Range, near the great bend of the Columbia River, in Kitattas County, Washington.

J. M. BOUTWELL,
Recording Secretary.

DISCUSSION AND CORRESPONDENCE.

TELEPATHY ONCE MORE.

TO THE EDITOR OF SCIENCE: Why Professor Titchener should have taken an essay which he now admits to have completely failed even to make probable its point, as an example of the 'brilliant work' which 'scientific psychology' can do in the way of destroying the telepathic superstition, may be left to be fathomed by readers with more understanding of the ways of 'Science' than I possess.

Meanwhile, as one interested in mere accuracy, I must protest against two impressions which Professor Titchener, in your number of May 10th, seeks to leave upon the reader's mind.

The first is that whispering was first considered by Professor Lehmann. It has been elaborately discussed in the S. P. R. Proceedings over and over again. Sidgwick's 6-page discussion of it in the report of his own experiments is the basis of comparison used by Lehmann in his ample but abortive investigation.

The second of Professor Titchener's implications is that it was Lehmann who introduced number-habits, and even forced the admission of them on the recalcitrant Sidgwick. Lehmann makes no mention of number-habits. Sidgwick himself introduces them to account, not for the thought transference results, but for the many errors common to the guesses of his Subjects and

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 new without interest:

In order to test if the action of the breaker could be due to a spheroidal 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.

HOWARD McCLENAHAN.

PHYSICAL DEPARTMENT, PRINCETON UNIVERSITY.

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 Sinigaglia, 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.