SCIENCE

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MSS. intended for publication and books, etc., intended for review should be sent to the responsible editor, Professor J. McKeen Cattell, Garrison-on-Hudson, N. Y.

THE POTENCY OF ENGINEERING SCHOOLS AND THEIR IMPERFECTIONS.*

IT is natural at a time like this to revert in thought to the teaching of engineering in the technological schools of the country, and to ponder on the influence which this teaching produces upon their pupils and upon the economic welfare of the land. I have assumed that some consideration of this question will interest my audience today. A discussion of the potency in the body politic of engineering education is particularly appropriate before the school of applied science located under the inspiring heights of your majestic mountains, which afford an unrivaled richness to him who attacks their depths with efforts properly directed by science. Applied science gives you the power of reaching your ore, hoisting, treating and finally smelting it —applied science, which has been taught

* Address delivered before the School of Applied Science of the University of Colorado on November 14, 1902 on the occasion of the celebration of the quarter centennial anniversary of the University.

different in each individual instance. The term 'prosodemic' has been used to describe this form of infection. Such prosodemic disease, they rightly consider, should be mainly considered in the analysis of data bearing upon seasonal prevalence. An epidemic must always be looked upon as a perturbing element. Curves based upon a small number of cases will always be liable to show irregularities due to single epidemics, and this is the explanation in four of the nine cities of their irregular seasonal curves. In the case of the other cities, the curves of which are based on ample statistics—Chicago, Cincinnati, Newark, Paris and Philadelphia—the curves show secondary maxima—one in December or January, the other between March and May. These five cities draw their supply from surface sources liable to gross pollution. Heavy autumn rains and spring floods carry into these surface water supplies a larger amount of pollution than reaches them at any other time.

The authors generalize: Winter and spring epidemics are characteristic of those cities whose water supply is most subject to pollution; they are absent from communities which use filtered water or water obtained from adequately protected watersheds. They conclude that wherever a sufficient number of cases have been considered a direct relation between typhoid fever and temperature appears to be general and invariable.

The probable mechanism of the seasonal changes, according to their conception, may be given in their own words: "The bacteriology and the etiology of typhoid fever both indicate that its causal agents can not be abundant in the environment during the colder season of the year. The germs of the disease are carried over the winter in the bodies of a few patients and perhaps in vaults or other deposits of organic matter, where they are protected from the severity of the season. The number of persons who receive infection from the discharge of these winter cases will depend, other things being equal, upon the length of time for which the bacteria cast in these discharges into the environment remain alive and virulent. The length of the period during which the microbes live depends largely upon the general temperature; as the season grows milder, more and more of each crop of germs sent at random into the outer world will survive long enough to gain entry to a human being and bear fruit. The process will be cumulative. Each case will cause more secondary cases, and each of the latter will have a still more extensive opportunity for widespread damage. In our opinion the most reasonable explanation of the seasonal variations of typhoid fever is a direct effect of temperature upon the persistence in nature of germs which proceed from previous victims of disease."

This paper on the seasonal prevalence of typhoid fever merits a careful study in the original, and, in the main, one familiar with this subject must be impressed with the justness of the conclusions based upon the data there brought together.

PHILIP HANSON HISS.

SCIENTIFIC JOURNALS AND ARTICLES.

THE April number of the *Transactions* of the American Mathematical Society contains the following papers: 'The approximate determination of the form of Maclaurin's spheroid,' by G. H. Darwin; 'On twisted cubic curves that have a directrix,' by H. S. White; 'Ueber Curvenintegrale im m-dimensionalen Raum,' by L. Heffter; 'The generalized Beltrami problem concerning geodesic representation,' by E. Kasner; 'On the holomorph of a cyclic group,' by G. A. Miller; 'Quadric surfaces in hyperbolic space,' by J. L. Coolidge; 'Ueber die Reducibilität der reellen Gruppen linearer homogener Substitutionen,' by A. Loewy; 'On the possibility of differentiating term by term the development for an arbitrary function of one real variable in terms of Bessel functions,' by W. B. Ford; 'On a certain congruence associated with a given ruled surface,' by E. J. Wilczynski; 'On the class number of the cyclotomic number field $k(e^{2\pi i/p^n})$,' by J. Westlund.

THE May number of the *Bulletin* of the American Mathematical Society contains: Report of the February meeting of the

American Mathematical Society, by F. N. Cole; 'On the foundations of mathematics' (presidential address), by E. H. Moore; 'Concerning the axiom of infinity and mathematical induction,' by C. J. Keyser; 'A German calculus for engineers' (review of Fricke's 'Calculus'), by E. R. Hedrick; Notes; and New Publications.

THE current number of the *American Journal of Mathematics* contains the following articles:

EDWARD KASNER: 'The Double-Six Configuration Connected with the Cubic Surface, and a Related Group of Cremona Transformations.'

SAUL EPSTEEN: 'Untersuchungen über lineare Differentialgleichungen 4. Ordnung und die zugehörigen Gruppen.'

A. N. WHITEHEAD: 'The Logic of Relations, Logical Substitution Groups and Cardinal Numbers.'

JOHN WESLEY YOUNG: 'On a Certain Group of Isomorphisms.'

F. E. ROSS: 'On Differential Equations Belonging to a Ternary Linearoid Group.'

THE April Number of the *Biological Bulletin,* Volume IV., No. 5, contains the following articles:

EDMUND B. WILSON: 'Notes on Merogony and Regeneration in *Renilla*.'

CARL H. EIGENMANN and CLARENCE KENNEDY: 'Variation Notes.'

WALTER S. SUTTON: 'The Chromosomes in Heredity.'

HENRY LESLIE OSBORN: 'On *Phyllodistomum americanum* (n. sp.); a New Bladder Distome from *Amblystoma punctatum*.'

THOS H. MONTGOMERY: 'The Heterotypic Maturation Mitosis in Amphibia and it General Significance.'

BASHFORD DEAN: 'An Outline of the Development of a Chimæroid.'

SOCIETIES AND ACADEMIES.

THE ACADEMY OF SCIENCE OF ST. LOUIS.

IT is a pleasure to record that the Academy of Science of St. Louis, which has thus far in its existence met as a tenant or guest, is now in possession of a home of its own in which it will probably be installed before the end of the current year.

Some months since, Mrs. Eliza McMillan and her son, Mr. William Northrop McMillan, offered to purchase for the academy a piece of property on Olive Street between Spring and Vandeventer avenues, in what is now coming to be the central district of St. Louis, as a memorial to the late William McMillan, who, at the time of his death, was a member of the academy. The transfer has now been effected and was announced by the council at the regular academy meeting of April 6, on which occasion the following resolutions were unanimously adopted:

"RESOLVED, That the members of the Academy of Science of St. Louis most gratefully accept from Mrs. Eliza McMillan and Mr. William N. McMillan, the gift of a permanent home for the academy. We feel that this generous donation will infuse new life into the institution and will insure its future usefulness. We pledge ourselves to use every effort to make it worthy of the confidence thus shown by the donors and to maintain the object of its founders, as expressed in the Act of Incorporation—'the advancement of science and the establishment in St. Louis of a museum and library for the illustration and study of its various branches.'

"RESOLVED by the members of the Academy of Science of St. Louis, that the property conveyed on the 18th day of March, 1903, by Edgar R. Hoadley and Luvinia L. Hoadley to the Academy of Science of St. Louis, which property is the gift of Mrs. Eliza McMillan and William N. McMillan, shall not be mortgaged or encumbered so long as it remains the property of the Academy of Science.

"RESOLVED, further, that the property shall not be sold except by a two thirds vote of the members of the Academy of Science of St. Louis by letter-ballot in the manner prescribed by the council, and that when sold, the proceeds of the sale, or as much thereof as may be necessary, shall be used to provide a suitable location and building for the uses of the Academy of Science."

In introducing the foregoing resolutions, Professor Nipher, long a member of the academy and for a considerable period its president, said:

"I can not allow this occasion to pass without calling attention to the great significance of the announcement which has been made this evening.

"Ever since the academy was organized, in