from five-horse power upward. The improvement consists in an automatic arrangement by which the pressure between the clamps is adjusted to compensate for irregularities in lubrication, etc. The two clamps are connected by a system of levers, so arranged, that, if there is a tendency for the whole system to revolve in the direction of revolution of the pulley, the pressure between the clamps is decreased; if it begins to move in the other direction, the pressure increases. This seems a great improvement over the ordinary Prony brake, and will be useful in measuring the efficiency of steam-engines, large electric motors, gas-engines, etc. It cannot, however, replace transmission dynamometers for many purposes, and it is probably not so efficient as the best of the latter class; the Tatham dynamometer, for example. It is an instrument that can be cheaply made, and no doubt will be extensively used.

HEALTH MATTERS.

Cholera-Infantum and the Weather.

AT a meeting of the New York Academy of Medicine, held in February, Dr. A. Seibert read a paper on cholera-infantum and the weather. The frequency and fatality of this disease in this latitude during the summer months make this subject one of great interest. Dr. Seibert includes under the name 'cholera-infantum' all cases of acute gastro-intestinal catarrh in children under five years of age. The basis for this paper was an experience of ten years (1878 to 1888) in the children's department of the German dispensary of New York City, during which time 8,036 cases of gastro-intestinal catarrh had been treated. The disease exists all the year round, even in the coldest weather; and the proportionate mortality, one in four, is just the same in cold as in hot weather. This he claims is shown not only by his own statistics, but also by those of the board of health. The largest number of cases, however, occurred during the summer months. Thus, in the ten Julys there were 2,443 cases, and in the ten Augusts 1,524 cases, while in the ten Februarys there were only 117 cases. The number of deaths was always much greater in July than in August. Thus, during the ten years, the number of deaths reported in the city of New York in the month of July was 12,428, and in August only 6,205. In July, 1881, when the mean temperature was 80°, the number of cases treated in the dispensary was 290; in August of the same year, when the mean temperature was 82°, the number of cases was 223; and in September, when the mean temperature was 87°, the number of cases was 137. During the summer months it was found that the number of cases and of deaths bore no relation whatever to the rise and fall of temperature, and the same was true as regards the range of humidity; so that warm, moist weather did not predispose more to the disease than warm, dry weather. No relation could be demonstrated between the prevalence of the disease and the rainfall, and the same was true in regard to the velocity of the air-current. According to prevalent opinion, the months containing the greatest number of hot days ought to have had the greatest number of cases and of deaths; but there was no evidence supporting this. It is evident, Dr. Seibert thinks, from the facts, that *hot* weather is not necessary for the production of the disease, but that *warm* weather is. Statistics show that in the early part of the summer season, as soon as the minimum daily temperature remains above 60° for a number of days (a week or more), the disease becomes epidemic; and this, no matter how high above 60° the temperature may go, whether it is 75°, 80°, or 85°. His conclusions are as follows: First, Hot weather, either dry or moist, is not necessary for the epidemic appearance of acute gastro-intestinal catarrh; Second, Warm weather, either dry or moist, showing a minimum daily temperature of not less than 60°, brings on the epidemic every year, irrespective of the height of the maximum daily temperature; Third, The disease loses its epidemic character as soon as the minimum daily temperature falls below 60°, as in October; Fourth, Therefore this disease cannot be brought about by the direct effect of high temperature upon the child's body.

Dr. Seibert then went on to say that the lowest temperature of each day was reached during the night; and it was at this time that the milk which furnished the principal food of so many young children was brought into the city. It was often carried long distances, being much jolted about, and absorbing impurities from the time it left the cow: it was therefore only a question how far the decomposition of the milk had advanced by the time it reached the child. It was well known that a low temperature retarded decomposition; and Dr. Cyrus Edson, of the New York Health Department, had informed him that in his experience he had found that milk usually began to turn whenever its temperature reached 60° or higher. Chief-Engineer Birdsall, of the Department of Public Works, had also informed him, that, whenever the temperature of Croton Lake rose to 60° or above, there was a peculiar taste about the water, which he attributed to the decomposition of certain matters contained within it.

As to the point why there are always so many more cases and deaths in July than in August, the difference usually amounting to at least one-third, it seemed to him that it might perhaps be explained by the fact that it took a few weeks after the onset of warm weather to fully arouse the tenement-house population to the danger to which their children were exposed from this disease, and to the necessity of taking suitable precautions as regards fresh air and diet for its prevention.

In the discussion which followed the reading of the paper, Dr. L. Emmett Holt referred to some statistics of Liverpool which tended to confirm some of Dr. Seibert's conclusions. In one year 347 deaths occurred from cholera-infantum in July, the average temperature being 58.9° F., while in August, when the temperature was 59.2°F., there were 969 deaths. Dr. Holt said that in summer there were different forms of diarrhœal disease in growing children, and that he thought it was advisable that some distinction should be made between them. In the production of what is ordinarily known as 'summer-complaint,' he believed that there were four principal factors concerned, — namely, heat, feeding, sanitary conditions, and constitution, — and that the most important of these features was heat.

Dr. J. Lewis Smith thought that there was perhaps a fallacy in comparing summer diarrhœa with that of winter; the two being, in his opinion, very different diseases. He believed that summer-complaint was due to heat, but just how this acted was not yet known. Heat alone is not sufficient, else the disease would be prevalent in the country as well as in the city. How much gaseous exhalation had to do with its production was not ascertained. The opinion is gaining ground that summer diarrhœa is a microbic disease. It was well known that milk which had begun to decompose had a tendency to give rise to the affection. In Asiatic cholera the causative agency of Koch's bacillus had been pretty generally accepted, and it was believed that this microbe was received into the mouth, and acted as a source of irritation to the intestines by its actual presence, and not by causing decomposition of food. In like manner it did not seem unreasonable to suppose that micro-organisms might act in the same way in some cases of summer diarrhœa.

Dr. A. Caille thought that decomposing milk was the chief exciting cause, while a high temperature paves the way. Two French physiologists had made some experiments by exposing animals to a continual temperature of 104°, and the phenomena which they observed to result from the exposure were: (1) increase of nervous excitability; (2) nervous depression; and (3) convulsions, coma, and death; death resulting more speedily in a moist high temperature than in a dry high temperature. The same results had been noticed to be produced in children when the weather was very hot. It was his opinion, therefore, that while high temperature did not directly produce diarrhœa, it did have a pernicious effect upon the system, and under these circumstances any irritating substance would be likely to give rise to diarrhœa.

As regards the smaller number of cases of summer-complaint, as well as of deaths from the disease, in August than in July, he thought that perhaps one reason for this was that a much larger number of children left the city in August than in July, while those which remained had the advantage of the numerous fresh-air excursions then provided for the poor.

Dr. A. Jacobi said that the cases which occurred were not all alike. In some there was a simple catarrh, in others a tendency to collapse. He thought that great heat would kill by its direct effect on the heart, the myosin of the muscular tissue of that organ being coagulated by the heat. Intense heat would cause a dilatation of

the blood-vessels of the surface of the body, and deficient nutrition of the brain would result, and collapse. These were the fatal cases among both the rich and the poor.

WASTED SUNBEAMS; UNUSED HOUSETOPS. — In a recent number of the *New York Medical Record*, Dr. Gouverneur M. Smith makes some extremely valuable suggestions in an article entitled "Wasted Sunbeams; Unused Housetops.' He says that human habitations, though erected for the benign purposes of insuring comfort, affording protection, and promoting family privacy, are, unfortunately, often the causes of a number of the morbid ills from which mankind suffers. This fact is true, as relating to the residences both of the rich and of the poor. It is a difficult task to construct an absolutely sanitary dwelling. In nearly every house, however, there are more or less avoidable insalutary conditions, which are undermining the health of each family circle. After describing the advantages of tent-life, and the benefits which accrued to those who lived most of the time out of doors, he goes on to speak of the incompatibility of such a life with the demands of a civilized race, and a rigorous climate. History tells us that certain nomadic tribes in the early ages, finding aggregation and permanency of residence desirable for business and other purposes, built solid structures, and, striking their tents, henceforth dwelt in substantial residences. While the early Orientals had but little knowledge of the exact nature of air and sunlight, they nevertheless believed that fresh air was an important factor in maintaining physical vigor, and that exposure to the solar beams was salutary. In constructing their homes, their architects utilized their housetops, and gave them salubrious plateaus. The roofs, gently declining as watersheds, were covered either with tiles, bricks, or cement, makthem as durable as pavements. Beddings of turf, prettily distributed, made these artificial deserts to 'blossom as the rose.' Dr. Smith asks the question, "Is there any thing, either in our climate or state of civilization, which prevents us from, in a measure, imitating such ancient, useful, and fashionable airiness?" Our atmosphere is proverbially bright, and many of the severer days are sunshiny. In a great metropolis like New York there are thousands of children and invalids, to say nothing of those in mature years and engaged in the ordinary pursuits of life, who require more fresh air and sunning than is now practicable. City yards are small, shut in by tall buildings and high fences; the parks may not be adjacent; and the streets afford ill-conditioned pleasure-grounds. He suggests that it would be no difficult task for architectural ingenuity, assisted by sanitary science, to contrive some method of using the thousands of acres of housetops so that roofs, now so useful in affording indoor protection from cold, sleet, and rain, can be made additionally useful at certain seasons by affording out-door recreation and protection for invalidism. The 'solarium' of the New York Hospital, made attractive with its plants, birds, and aquaria, is a potent ally of therapeutics in restoring the convalescents, and at the Hospital for the Relief of the Ruptured and Crippled the contagious sparkle of the sunbeam is found shining in the eyes and lives of the young patients.

BOOK-REVIEWS.

Exact Phonography. By GEORGE R. BISHOP. New York, The Author (At the New York Stock Exchange). 12°. $2.

EVERY writer of shorthand has often had occasion to regret the imperfections of the best of the modern systems. Pitman's 'Phonography,' with the American modification of it, and one or two others, English and American, which are in the main attempted improvements upon it, are almost perfect as to the representation of the consonant sounds and their combinations, and, if one attempts nothing more than the 'corresponding style,' are quite as unambiguous and legible as fairly written longhand script. But while the 'corresponding style' may be written much more rapidly than longhand, it is impossible to attain sufficient speed in it to make it available for the uses of the reporter, or of the student, professional, or business man, who desires to use it for jotting down quickly notes of what he sees or hears. To adapt it to these practical ends, it has been found necessary in all the older systems to abbreviate, sometimes at the expense of exactness and legibility. Vowels have been almost entirely omitted, and indicated by the position with reference to the line of the ruled paper upon which the consonants are written; and as only three positions are used, while there are nearly twenty different vowel-sounds, it follows that the same character in the same position frequently represents three or four different words (in a few cases from six to a dozen). The context alone can show which of these words was intended, and the success of the writer in determining this at any future time will depend largely upon his knowledge of the subject treated of, or upon the tenacity of his memory. The prevailing systems of shorthand, also, fail when a great number of technical terms or foreign words or phrases are introduced, unless the terms, words, or phrases are those with which the reporter is familiar, and for which he has invented special contracted forms. Mr. Bishop, who is the stenographer of the New York Stock Exchange, has undertaken the difficult task of devising a system of shorthand in which, without sacrificing brevity and speed, all essential vowel-sounds shall be actually represented by written signs. His purpose is to leave little or nothing to the judgment or memory of the writer in transcribing. It is impossible, without making a practical trial of Mr. Bishop's 'Exact Phonography,' to determine to what extent he has succeeded. His system is certainly exact and unambiguous, and therefore easily legible, even in its most contracted forms; and it looks as though it might be written with as great speed as any of the older systems. Mr. Bishop calls his book 'A Text-Book for Self- and Class-Instruction.' It is certain that no previous new system of shorthand has been introduced to the public with so much fulness of explanation and wealth of illustration as 'Exact Phonography.' Every thing is made perfectly plain for the attentive student.

European Schools of History and Politics. By ANDREW D. WHITE. Baltimore, Murray. 8°.

IN *Science*, No. 253, we noticed the two interesting papers by Dr. H. B. Adams and Professor Fredericq on historical teaching in the United States and in England and Scotland. The present paper, by ex-President White, supplements these. It is the last issue for the year 1887 in the Johns Hopkins Series of Studies in Historical and Political Science. Most of Mr. White's accounts are based on his personal observation, and gain thereby much in value. On p. 11 we read, "As to the general character of all this instruction among German-speaking peoples, whatever it may have been in the past, it is not at present calculated to breed *doctrinaires*; it is large and free; the experience of the whole world is laid under contribution for the building-up of its students; questions of living interest have their full share in the classrooms. To know how our own democracy is solving its problems, one of the German universities sends to this country for study one of its most gifted professors, — one from whom thinking men on this side of the Atlantic have been glad to learn the constitutional history of their own country. The lectures of Professor von Holst, as delivered here, and his work upon the constitutional history of the United States, are sufficient to show that this instruction in the German universities is given in a large way, and is not made a means of fettering thought. At no seats of learning in the world, probably, is political thought more free. The University of Berlin stands in the main avenue of the capital of the German monarchy directly opposite the imperial palace. Within a stone's throw of the Emperor's work-table are the lecture-desks of a number of professors, who have never hesitated to express their views fully upon all the questions arising between democratic and monarchical systems. I have myself, in these lecture-rooms, heard sentiments freely uttered which accorded perfectly with the ideas of Republican and Democratic American statesmen." In a similar way the historical and political teaching in France is favorably commented on. The most valuable portion of the paper is that in which the writer applies the experience of Europe to ourselves, and points out what we should be doing in this direction, and how we may do it. It is an eloquent and able plea for broader and better historical and political teaching in our own colleges and universities. As an appendix to the main paper, there are printed 'Modern History at Oxford,' by W. J. Ashley; 'Recent Impressions of the École Libre,' by T. K. Worthington; and 'Preparation for the Civil Service in the German States,' by L. Katzenstein.