these, the total number of deaths was only 71. It is only by palpable and wilful misrepresentation that a number differing from the above, and differing by more than double, has been published by those who are systematic enemies of the method. In short, the general mortality applicable to the whole of the operations is 1 per cent; and, if we subtract from the total number of deaths those of persons in whom the symptoms of hydrophobia appeared a few days after the treatment, — that is to say, cases in which hydrophobia had burst out (often owing to delay in arrival) before the curative process was completed, — the general mortality is reduced to .68 per cent. But let us for the present only consider the facts relating to the English subjects whom we have treated in Paris. Up to May 31, 1889, their total number was 214. Of these, there have been five unsuccessful cases after completion of the treatment, and two more during treatment, or a total mortality of 3.2 per cent, or, more properly, 2.3 per cent. But the method of treatment has been continually undergoing improvement; so that in 1888 and 1889, on a total of sixty-four English persons bitten by mad dogs and treated in Paris, not a single case has succumbed, although among these sixty-four there were ten individuals bitten on the head, and fifty-four bitten on the limbs, often to a very serious extent. I have already said that the lord mayor, in his invitation, has treated the subject in a judicious manner, from the double point of view of prophylaxis after the bite and of the extinction of the disease by administrative measures. It is also my own profound conviction that a rigorous observance of simple police regulations would altogether stamp out hydrophobia in a country like the British Isles. Why am I so confident of this? Because, in spite of an old-fashioned and widespread prejudice, to which even science has sometimes given a mistaken countenance, rabies is never spontaneous. It is caused, without a single exception, by the bite of an animal affected with the malady. It is needless to say that in the beginning there must have been a first case of hydrophobia. This is certain; but to try to solve this problem is to raise uselessly the question of the origin of life itself. It is sufficient for me here, in order to prove the truth of my assertion, to remind you that neither in Norway, nor in Sweden, nor in Australia, does rabies exist; and yet nothing would be easier than to introduce this terrible disease into those countries by importing a few mad dogs. Let England, which has exterminated its wolves, make a vigorous effort, and it will easily succeed in extirpating rabies. If firmly resolved to do so, your country may secure this great benefit in a few years; but, until that has been accomplished, and in the present state of science, it is absolutely necessary that all persons bitten by mad dogs should be compelled to undergo the anti-rabic treatment. Such, it seems, is a summary of the statement of the case by the lord mayor. The Pasteur Institute is profoundly touched by the movement in support of the meeting. The interest which his royal Highness the Prince of Wales has evinced in the proposed manifestation is of itself enough to secure it success. Allow me, my dear colleague, to express my feelings of affectionate devotion."

## BOOK-REVIEWS.

*Der Hypnotismus.* Von Dr. Med. ALBERT MALL. Berlin. 8°.

THE modern study of hypnotism may now be said to have outgrown the limits of its birthplace, France, and to have acquired that universal recognition that belongs to a scientifically established body of doctrines. The attitude of Germany towards these extremely fascinating experiments and results was at first suspicious, then rather adversely critical. Now, while retaining a judicious scepticism regarding the more surprising results, German scholars have come to recognize the intrinsic value of hypnotism as a psychologic method, as well as the importance of the place it occupies in modern psychology.

The German literature consists in the main of single contributions, partly critical and partly original, dealing with single phases of the various hypnotic conditions. There have been but few general treatises aiming at a convenient *résumé* of what has been established, and the present work by Dr. Mall is a rather successful attempt to supply this lack.

The work is methodically arranged, intelligibly written, but is defective in laying too much stress upon individual minor points of special interest to the author, and in a lack of clear distinctions between the important and the subsidiary, perhaps uncertain points.

After a brief historical introduction, in which some hitherto neglected points in the history of hypnotism in Germany are noted, the general symptoms of the hypnotic conditions are described. The various stages are distinguished as to their intensity merely, no other criterion as yet offered being found satisfactory. The more detailed description consists of a physiological and a psychological portion. In the former the changes in the movements and sensations, in the latter effects brought about in the region of memory association and more complicated processes, are described. This is naturally the most important part of the work, and is a useful *résumé* of the position taken by the Nancy school. The processes are described throughout as explicable on the ground of suggestion, conscious or unconscious. The *rôle* of the latter is particularly important, and finds here due recognition. A further point of view pervading the entire exposition is the assimilation of psychic and physiological conditions observed in hypnotism with analogous occurrences in sleep and waking life. This analogy with the phenomena of normal sleep is both real and important; and, while it does not warrant our regarding hypnotism as something entirely normal, it ought to remove the usual view that places it entirely in the region of pathology.

The latter half of the work deals with various aspects of hypnotic study, its theoretical bearings, its practical bearings as a therapeutic agent, its forensic aspect as a means of concealing crime, the allied conditions found in the lower animals, and so on. While some of the opinions there set forth will doubtless have to be modified, the work none the less reflects the present state of knowledge very well. The work is not original, except in its arrangement and the various degrees of importance it attaches to different results of experimentation. The chief objection to its use by the laity is the rather uncritical collation of good and indifferent works, of important and trivial points. As a contribution to the German literature on hypnotism, it is welcome, and will find use.

## AMONG THE PUBLISHERS.

A HOST of boys and girls under eighteen years of age have been profiting themselves, and at the same time entertaining their teachers, parents, and friends, by telling prize-stories in *Treasure Trove Magazine* of New York. They have won cash prizes to the extent of two hundred dollars, besides seventy dollars' worth of books. Story-telling as a means of education is taking a first place in the regular exercises of our public schools, where the usually irksome task of composition-writing, upon which so many other studies depend, has been turned by these prize-story competitions into a genuine pastime.

— *Babyhood* for July contains much seasonable advice for mothers of young children, the question of where to go and where not to go during the summer months being thoroughly discussed. "Botany for the Little Ones" is continued, and there are entertaining and instructive contributions concerning the many perplexing questions that are apt to arise at the present time in the city nursery as well as in the temporary country home.

— Messrs. E. & F. N. Spon announce as in preparation "Chemical Technology: the Application of Chemistry to the Arts and Manufactures," by C. E. Groves and William Thorp (about 8 volumes); and "Egyptian Irrigation," by W. Willcocks, M.I.C.E., with introduction by Lieut.-Col. J. C. Ross, R.E., C.M.G., being a physical description of Egypt, with particulars of various methods of irrigation and drainage, and full details of engineering construction, and illustrated by numerous plates. They also announce as nearly ready, "The Engineer's Sketch-Book of Mechanical Movements, Devices, Appliances, and Contrivances," by Thomas Walter Barber, containing details employed in the design and construction of machinery for every purpose; collected from numerous sources and from actual work; classified and arranged for reference for the use of engineers, mechanical draughtsmen, managers, mechanics, inventors, patent agents, and all engaged in the mechanical

arts; with nearly two thousand illustrations, descriptive notes, and memoranda: and as ready July 1, "Practical Gold Mining: a Comprehensive Treatise on the Origin and Occurrence of Gold-Bearing Gravels, Rocks, and Ores, and the Methods by which the Gold is Extracted," by C. G. Warnford Lock, illustrated by numerous plates and engravings.

— The frontispiece of the August issue of *Scribner's Magazine* will be a striking portrait of Lord Tennyson, engraved by Kruell from a recent photograph. Recognition is thus made of Tennyson's eightieth birthday, which occurs in August. The same number will contain a short essay by Dr. Henry van Dyke on Tennyson's earliest poems published with his brother; and the end paper, by Professor T. R. Lounsbury of Yale, will discuss Tennyson's attitude toward life in youth and old age, under the title of "The Two Locksley Halls." The time has arrived when every one wants to know what is being done to advance and extend the art of electric lighting, and President Henry Morton of Stevens Institute, in his article in the same number of *Scribner's*, will explain some of the most recent achievements. He will describe such matters as lighting the Hoosac Tunnel with glow-lamps, the lighting of Hell Gate, of the great public squares, and other interesting undertakings, all very fully illustrated. James Dwight, M.D., a leading authority in this country and England, on the game of lawn tennis, will contribute a careful study of "Form in Lawn Tennis," based on a series of instantaneous photographs of the best players at work, showing the exact position taken in making all the principal strokes. Models for these photographs were Mr. R. D. Sears, the late champion, assisted by his brother, Mr. P. S. Sears, and Mr. Thomas Pettitt, the professional tennis champion. These have been excellently engraved, and are very picturesque as well as of great value to tennis players. Benjamin Norton, the nephew of Austin Corbin, and second vice-president of the Long Island Railway, will contribute a short paper entitled "How to Feed a Railway," which will describe the purchasing and supply department. The closing article in the railway series will appear in the September number under the title of "Safety Appliances in Railroad Working," by H. G. Prout, editor of the *Railroad Gazette*.

— "The Spirit of Manual Training" will be set forth by Professor C. H. Henderson of Philadelphia, in an article which is to open the August *Popular Science Monthly*. Professor Henderson says that the ideal school will aim to develop men, not to produce fine articles of wood or iron, or to cram heads with information, and that the name "manual-training school" does not rightly describe an institution designed to train the "whole boy." Professor Huxley will review the main points of the controversy in which he has been engaged, in an article entitled "Agnosticism and Christianity." Some of Cardinal Newman's writings will receive a share of caustic criticism in this paper. A suggestive article on "The Wastes of Modern Civilization," by Felix L. Oswald, M.D., will appear, in which Dr. Oswald will point out a number of ways in which the resources of the modern world are used up, with no care for their replenishment, or in producing useless or harmful results; and "Mr. Mallock on Optimism" is the title of a critical article which Mr. W. D. Le Sueur will contribute to the August *Popular Science*. It repels the assertions of Mr. Mallock, that there is not sufficient reason for being gratified with the prospects of the human race, and that no meaning in life can be seen without the light of theological faith.

— Messrs. Ginn & Co. announce for publication in August "The Irregular Verbs of Attic Prose, their Forms, Prominent Meanings, and Important Compounds, together with Lists of Related Words and English Derivatives," by Addison Hogue, professor of Greek in the University of Mississippi. The material treated in this book is here much fuller than in the lists of irregular verbs in the grammars, and much more accessible than in the lexicons. The book contains, after the regular verbs, — pure, mute, and liquid, — the irregular verbs of Attic prose in alphabetical order. Prominent meanings and special uses of frequent occurrence are given, often illustrated by translated examples. The most important compounds are added, and also many related words, forming a very practical sort of introduction to word-formation. The first declension alone is represented by about 400 substantives, and this indicates the range of vocabulary. The English derivatives, of which there are over 450, will prove, it is hoped, an attractive feature to teachers and students alike. To the latter they will be an additional support in learning some five or six hundred Greek words, and will broaden their knowledge of their own tongue.

— At this time, when the centennial anniversaries of the various events connected with the beginning of the French Revolution are coming so thick and fast, many who desire to make new studies of that great period of history will get help from the Old South leaflet on the French Revolution, issued by the directors of the Old South Studies in History, and published by D. C. Heath & Co. This little sixteen-page leaflet, which is sold for five cents, contains one of the powerful chapters from Carlyle's history, on the condition of France on the eve of the Revolution, brief extracts from John Morley and others, and several pages of historical and bibliographical notes by Mr. Edwin D. Mead. All the important books upon the Revolution are noticed, with brief estimates of their several merits; the French Revolution is compared with the English Revolution of 1688 and with the American Revolution; and a special section is devoted to the various significant events taking place in the world in the eighteenth century, which will prove useful for fixing in the minds of students some important dates worth remembering in relation to each other.

— The *Quarterly Journal of Economics* (Boston, George H. Ellis) closes its third year with the July number. Edward Cummings contributes a study of the present condition of the English trades-unions, made with great advantages on the spot; Professor Dunbar reviews the history of the direct taxes of the United States, from the tax of 1798 to the last, in 1861; Stuart Wood develops his new theory of wages; and several notes on a variety of topics follow, including one by the new president of Brown University, Professor Andrews, on the late copper syndicate. The usual full bibliography and copious indexes for the volume fill the remaining pages.

— The *Educational Times* (London) says, "We cannot be too lavish in our praise of the series of Greek authors now being published by Messrs. Ginn & Co. The book before us ["Homer's Odyssey," Books I. — IV., by B. Perrin] forms one of this series, and is in no way inferior in binding, paper, printing, and general style, to the other productions of this firm, which we have previously noticed with real pleasure. The notes and appendices furnish considerable material for the higher criticism of the poem, but at the same time sufficient assistance of an elementary character has been provided to make the volume useful as an introduction to the study of Homer. Text and notes appear on the same page, which does not seem to us a good plan; but, to make the work thoroughly complete, with each edition of text and notes the purchaser receives a separate copy containing the text only, and, since this text edition can only be obtained separately at a very small cost, we heartily recommend it to our readers."

— We have received from the Theosophical Book Company of Boston a pamphlet entitled "Light on the Path," which is intended as an initiation into the mysteries of occultism. It is said to have been "written down by M. C.;" the real author, we suppose, being some supermundane intelligence. The actual contents of the pamphlet are in part taken from Buddhism and other Eastern systems, and in part concocted by the author himself. The Buddhist doctrine of Karma is taught, and the reader is also told that he must kill out every kind of earthly desire. Besides these two tenets of Buddhism, various precepts are set forth, of which the following are specimens: "Hold fast to that which is neither substance nor existence. Listen only to the voice which is soundless. Look only on that which is invisible alike to the inner and the outer sense" (p. 17). The whole work, we are told, "is written in an astral cipher, and can therefore only be deciphered by one who reads astrally;" and we should think so. At the end of the pamphlet is a catalogue of the books issued by the publishers, to which they prefix this request: "Send us the addresses of those among your acquaintances who might be interested in the class of literature of which we make a specialty." So if any of our readers

choose to make a list of the fools they know, they can send it to the Theosophical Book Company.

— John Wiley & Sons announce as ready, "A Treatise on the Ordinary and Partial Differential Equations," by William Woolsey Johnson, professor of mathematics in the United States Naval Academy, Annapolis, Md.; "Submarine Mines and Torpedoes as applied to Harbor Defence," by John Townsend Bucknill, lieutenant-colonel Royal Engineers; "Elements of the Art of War," prepared for the use of the cadets of the United States Military Academy, West Point, N.Y., by James Mercur, professor of civil and military engineering; "A Laboratory Guide in Chemical Analysis," by David O'Brine, professor of chemistry in Colorado State Agricultural College; and "A History of the Planing-Mill," with practical suggestions for the construction, care, and management of wood-working machinery, by C. R. Tompkins, M.E.

— Messrs. Longmans, Green, & Co. announce that they have made arrangements to supplement their series, Epochs of Modern History, by a short series of books treating of the history of America, which will be published under the general title "Epochs of American History." The series will be under the editorship of Dr. Albert Bushnell Hart, assistant professor of history in Harvard College. Each volume will contain about two hundred and fifty pages, similar in size and style to the page of the volumes in the Epochs of History Series, with full marginal analysis, working bibliographies, maps, introductions, and index. The volumes will be issued separately, and each will be complete in itself. Those already arranged for will, it is hoped, provide a continuous history of the United States from the foundation of the Colonies to the present time, which shall be suited to class use as well as for general reading and reference. The volumes in preparation are as follows: "The Colonies (1492–1763)," by Reuben Gold Thwaites, secretary of the State Historical Society of Wisconsin, author of "Historic Waterways," etc.; "Formation of the Union (1763–1829)," by Albert Bushnell Hart, A.B., Ph.D., the editor of the series; and "Division and Re-union (1829–1889)," by Woodrow Wilson, Ph.D., LL.D., professor of history and political economy in Wesleyan University, Middletown, Conn., author of "Congressional Government," etc.

## LETTERS TO THE EDITOR.

### Are Beech-Trees ever struck by Lightning?

THIS is the question implied in your note on p. 7 of *Science* for July 5, 1889.

In August, 1885, at Mason, Ingham County, Mich., a number of men were at work harvesting wheat in a large field west of the village.

A heavy thunder-storm came up, and all but one of them, Aura Hines, fled for shelter to a saw-mill about a quarter of a mile distant. He said that his shoes hurt his feet, and he did not like to run so far; he would go to the woods, which bounded the field south, not far distant. After the storm (accompanied with heavy thunder and lightning) had passed, the men returned from the mill to their work, but Hines did not appear. They went in search, and found him sitting under and against a large beech-tree, dead.

Without disturbing his position, they sent to the village for help, and I went and saw him.

The tree was a large and tall one, about two feet in diameter, and leaned a little eastward. A pile of brushwood had been burned on the east side, which had killed the tree on that side from the roots to the height of seven feet from the ground. The storm came from westward, and Hines sat on the east side crouched against the tree, which sheltered him from the rain. Two or three holes of half an inch diameter, near his right foot, showed where the current passed from the earth to his body, partly tearing the sole from his shoe, and passing through the crown of the coarse straw hat on his head, making a half-inch hole, as if a bullet had been fired through it; the broken straws pointing upward and outward.

There was a plain furrowed trace on the burned and dead bark of the tree above his head, to the green and living wood, but no farther.

The wood of the beech is very close grained, and in the living tree full of sap, and the green bark is also filled with sap, while the outer or ross bark is thin and quite smooth.

Has not such a tree the elements of a good conductor, over which the electric fluid passes, without shattering it or leaving a trace?

If this is true, beech-trees are probably struck by lightning as often as any others, but it leaves no trace of its passage over them.

H. D. POST.

Holland, Mich., July 14.

### A Navajo Tree-Burial.

FOR a number of years I enjoyed the opportunity of studying the customs and traditions of three or four tribes of Indians in the vicinity of Fort Wingate, N. Mex., and during that period became very familiar with the method of disposing of their dead resorted to by the Navajos, one of the tribes to which I refer. They are, as we know, "cliff-buriers," as I have elsewhere described; and personally I never met with a case where they do not bury their deceased — men, women, and children — in the more capacious rents in the rocky cañons of the mountain-sides, where this tribe now inhabits. Recently, however, a well-authenticated case has been sent me where the Navajos had buried one of their dead children in a tree. This was done not long ago, only about a mile from Fort Wingate, and was discovered by Mr. Benjamin Wittick, who has taken an admirable photograph of the tree and the locality. The body of the child had been deposited, after having been wrapped in cloth and blankets, longitudinally on the limb of a large piñon-tree, about fifteen feet above the ground. A rude platform of dead and broken limbs was constructed to hold the body in position. Indeed, in all particulars the burial is characterized as a typical tree-burial, and is interesting from the fact that it constitutes such a remarkable departure from the general mortuary custom of that tribe of our Indians.

R. W. SHUFELDT.

Takoma, D.C., July 16.

## INDUSTRIAL NOTES.

### New Outfit of Electrical Engineering Apparatus for Princeton College.

MESSRS. JAMES W. QUEEN & CO. of Philadelphia, the well-known manufacturers and importers of electrical test instruments, report the sale of a bill of goods amounting to four thousand dollars to Princeton College for the equipment of their course in electrical engineering to be inaugurated in September next. The list embraces several of Queen's large Wheatstone bridge sets as devised by Professor William A. Anthony, and pronounced by Professor B. F. Thomas of Ohio State University "to be superior to Elliott's Dial Form." These sets, as well as several of the next size smaller, also ordered by Princeton College, are all guaranteed by Professor Anthony to be accurate within $\frac{1}{50}$ of one per cent. There is also a large $375 reflecting galvanometer made for the special purpose of measuring high insulation resistance, the galvanometer itself having a resistance of 500,000 ohms. This will be the only instrument of this character in the United States. For measuring induction co-efficients, etc., there is provided one of Ayrton & Perry's Secohmmeters. For the determination of magnetic constants there is a large Weber earth inductor which will be used, in addition to the Kew magnetometer already possessed by the physical department. There is also a Kohlrausch unifilar electro dynamometer for the measurement of very weak currents, such as those used in telephone work, etc. This suspension has the minimum amount of torsion as the current is conveyed out of the instrument by means of a platinum strip attached to the movable coil, and dipping into a dilute solution of sulphuric acid. A pair of Wiedemann's large dead beat reflecting galvanometers, Sir William Thomson's astatic reflecting galvanometer, one of Elliott's differential galvanometers as well as his ballistic instrument, a Wheatstone Kirchoff cylinder bridge, Kohlrausch's mirror differential galvanometer, condensers, telescopes, etc., go to make up the remainder of as fine an outfit of electrical test apparatus as has ever been sold at any one time in this country.