3. In sulphur chloride the sulphur is apparently dissociated to the same extent as in the vapor at high temperatures, the molecular complexity being represented by S_2.

On the Determination of Sulphur in Illuminating Gas and in Coal. By CHARLES F. MABERY.

The author uses a modification of Sauer's method, burning the gas in a tube in a stream of air, the products formed being absorbed in a standard alkaline solution. The coal is burned in the same way, being introduced into the tube in a platinum boat. The amount of sulphur left in the ash is less than 0.05 per cent. on an average.

Chemistry of the Berea Grit Petroleum. By CHARLES F. MABERY and O. C. DUNN.

A brief account is given of the most important wells and their output, and the character and properties of the petroleum from the Berea Grit.

A Method for the Standardization of Potassium Permanganate and Sulphuric acid. By H. N. MORSE and A. D. CHAMBERS.

If a known quantity of standard sulphuric acid is treated with hydrogen peroxide and potassium permanganate added as long as the color disappears, and more hydrogen peroxide and permanganate added until most of the acid has been used up, and the excess determined by titration with the standard ammonia solution, the strength of the permanganate can be easily calculated.

Some derivatives of unsymmetrical Tribrombenzol. By C. LORING JACKSON and F. B. GALLIVAN.

The authors find that two of the bromine atoms in tribromdinitrobenzol are easily replaced by treating with aniline or sodic ethylate. A number of derivatives are described.

Besides a review of recent work on Helium, and notes on the composition of Barium Picrate, and the proposed changes in the *Berichte* and '*Beilstein*,' this number contains reviews of the following books:

'Kurzes Handbuch der Kohlenhydrate,' Dr. B. Tollens; 'Die Chemie der Zuckerarten,' Dr. E. O. von Lippmann; 'Ostwald's Klassiker, Zur Entdeckung des Elektromagnetismus,' and 'Die Anfänge des natürlichen Systemes der chemischen Elemente;' 'Die Lehre von der Elektrizität,' G. Wiedemann; 'Physikalisch-chemische Propædeutik,' H. Griesbach; 'A Laboratory Manual of Organic Chemistry,' Dr. Lassar-Cohn; 'Jahrbuch der Elektrochemie;' 'Anleitung zur Molekular-gewichtsbestimmung nach der *Beckmannschen* Gefrier- und Siedepunkts-Methode,' Dr. G. Fuchs; 'Einführung in die mathematische Behandlung der Naturwissenschaften,' W. Nernst; 'Elements of Modern Chemistry,' C. A. Wurtz.

J. ELLIOTT GILPIN.

PSYCHE, APRIL.

S. H. SCUDDER gives a table to separate the 13 New England species of Melanopli, 10 of them belonging to the genus Melanoplus; H. F. Wickham continues former studies on myrmecophilous Coleoptera; and a notice is added of Plateau's recent experiments on insect vision. A Supplement contains the conclusion of C. F. Baker's account of some new New Mexican Homoptera and the beginning of descriptions of new species of bees of the genus Prosopis (or Prosapis, as the author prefers), by T. D. A. Cockerell.

SOCIETIES AND ACADEMIES.

NEW YORK ACADEMY OF SCIENCES.

AT the meeting of the Biological Section, on March 9th, 1896, Mr. F. B. Sumner read a paper on 'The Descent Tree of the Variations of a Land Snail from the Philippines,' illustrated by a lantern slide. Mr. Sumner described the range in variation in size and markings in the shell, and arranged the varieties in the form of a tree of three branches diverging from the most genealized type. It was shown that these several varieties occupy the same geographical region, and Mr. Sumner was of the opinion that their occurrence could not be explained by natural selection since if the colorations were supposed to be protective it would be impossible to explain the evolution of these three types. Prof. Osborn, in discussion, was inclined to take the same view. Dr. Dyar, however, thought the explanation by natural selection not necessarily excluded, since the variations seemed analogous to the dimorphism in sphinx larvæ, which has been shown by Poulton to be probably due to this factor.

The other paper was by Dr. Arnold Graf on 'The Problem of the Transmission of Acquired Characters.'

Dr. Graf discussed the views of the modern schools of evolutionists and adopted the view that the transmission of acquired characters must be admitted to occur. He cited several examples which seemed to support this view, and especially discussed the sucker in leeches as an adaptation to parasitism and the evolution of the chambered shell in a series of fossil Cephalopods.

Professor Osborn remarked in criticism of Dr. Graaf's paper that this statement does not appear to recognize the distinction between *ontogenic* and *phylogenic* variation, or that the adult form of any organism is an exponent of the stirp, or constitution. If the environment is normal the adult would be normal, but if the environment (which includes all the atmospheric, chemical, nutritive, motor and psychical circumstances under which the animal is reared) were to change, the adult would change correspondingly; and these changes would be so profound that in many cases it would appear as if the constitution or stirp had also changed. Illustrations might be given of changes of the most profound character induced by changes in either of the above factors of the environment, and in the case of the motor factor or animal motion the habits of the animal might, in the course of a life time, profoundly modify its structure. For example, if the human infant were brought up in the branches of a tree as an arboreal type instead of as a terrestrial, bi-pedal type, there is little doubt that some of the well-known early adaptations to arboreal habit (such as the turning in of the soles of feet and the grasping of the hands) might be retained and cultivated, thus a profoundly different type of man would be produced. Similar changes in the action of environment are constantly in progress in nature, since there is no doubt that the changes of environment and the new habits which it so brings about far outstrip all changes in constitution. This fact, which has not been sufficiently emphasized before, offers an explanation of the evidence advanced by Cope and other writers that change in the forms of the skeletons of the vertebrates first appears in ontogeny and subsequently in phylogeny. During the enormously long period of time in which habits induced ontogenic variations it is possible for natural selection to work very slowly and gradually upon predispositions to useful correlated variations, and thus what are primarily *ontogenic variations* become slowly apparent as *phylogenic variations* or congenital characters of the race. Man, for instance, has been upon the earth perhaps seventy thousand years; natural selection has been slowly operating upon certain of these predispositions, but has not yet eliminated those traces of the human arboreal habits, nor completely adapted the human frame to the upright position. This is as much an expression of habit and ontogenic variation as it is a constitutional character. Very similar views were expressed to the speaker in a conversation recently held with Prof. Lloyd Morgan, and it appears as if a similar conclusion had been arrived at independently. Prof. Morgan believed that this explanation could be applied to all cases of adaptive modification, but it is evident that this cannot be so, because the teeth here undergo the same progressively adaptive evolution along determinate lines as the skeleton, and yet it is well known that they do not improve by use, but rather deteriorate. Thus the explanation is not one which satisfies all cases, but it does seem to meet, and to a certain extent undermine, the special cases of evidence of the inheritance of acquired characters, collected by Prof. Cope in his well-known papers upon this subject.

C. L. Bristol,
Secretary.

NEW YORK ACADEMY OF SCIENCES.

At the meeting of the Section of Geology and Mineralogy of the New York Academy of Sciences, held March 16th, Prof. J. J. Stevenson in the chair, the first paper of the evening was presented by Mr. Heinrich Ries on 'A Visit to the Bauxite Mines of Georgia and Alabama.' The speaker first outlined the occurrence of bauxite in Europe and in the United States, illustrating his remarks by means of lantern slides. He then described his trip through the bauxite region of the States mentioned, using the same method of illustration and exhibiting

a large series of specimens. Mr. Ries showed the association of bauxite with occasional beds of limonite and lignite and the frequent occurrence of white clays in connection with the ore. In their geological relations nothing of moment was, however, brought to light that has not already been published by Dr. C. W. Hayes in his recent paper in the 16th Annual Report of the Director of the U. S. Geological Survey. In the discussion Mr. R. E. Dodge called attention to the close connection between the bauxite and the tertiary peneplain of the region, so that the ores are not found, except at a point where the great fault lines of the region cut the Knox dolomite between 900 and 950 feet above tide, as shown by Dr. Hayes. Prof. Kemp in discussion called attention to the close association of limonite and lignite with the bauxite, and remarked the close parallel that exists between these deposits and the siluro-cambrian iron ores of the North. In the South we have hydrated oxide of aluminum, with subordinate limonite. In the North the iron oxide is in excess, while the hydrated oxide of aluminum is present only in the somewhat uncommon mineral gibbsite. He also remarked the existence of lignites at Brandon, Vt., and Mont Alto, Pa. While the limonites of the North have been in part derived from the sulphate of iron produced by decomposing pyrites, but little hydrate of alumina seems to have been formed by the sulphuric acid which has also of necessity resulted. Prof. Kemp further remarked that a recent article in the *Engineering and Mining Journal* of March 14th stated that the gossan of the Royal gold mine, near Tallapoosa, Ga., extended a considerable distance below the present water, line and he suggested that it perhaps indicated a recent depression which has brought the oxidized zone below the ground water.

The second paper of the evening was by Mr. R. E. Dodge on 'The Cretaceous and Tertiary Peneplains of Eastern Tennessee,' on the basis of observations accumulated during two summers' field work in the region under Mr. C. W. Hayes, of the United States Geological Survey. The speaker described the geographical development since the cretaceous period of the country lying west from Chattanooga and across the Sequatchie Valley to the Mississippi River. By means of maps and sections Mr. Dodge first set forth the geology of the old cretaceous peneplain now forming the Cumberland Plateau with a few monadnocks projecting above it; next the tertiary peneplain that shows like a great shelf on each side of the river valley; and then the present river valleys and the plains to the west of the plateau region which are now being still further notched by the active streams. A map of the region that the speaker had prepared and colored so as to show the extent of each peneplain, or, in other words, the geographic development, was exhibited and commented upon. In discussion Prof. Stevenson remarked the high terraces that he had met along the Monongahela, Allegheny, Cheat and New Rivers in Pennsylvania and West Virginia. He referred to their uniform attitudes over wide areas and to their occurrences above the river terraces. He seemed to favor, however, the view that they were wave-cut terraces remaining from a period of submergence, but remarked that they were wonderfully well preserved for ones of ancient date, and that they exhibit an extraordinary lack of superficial pebbles such as should accompany a wave-cut terrace.

The section then elected for the ensuing year the same officers that had held office last year, viz: J. J. Stevenson, Chairman, and J. F. Kemp, Secretary.

J. F. KEMP,
Secretary.

ANTHROPOLOGICAL SOCIETY OF WASHINGTON.

THE 246th regular meeting of the Anthropological Society was held Tuesday, March 3, 1896. Surgeon General George M. Sternberg read a paper on 'Vivisection: Its Objects and Results.'

In the course of his paper Dr. Sternberg said that by dissection of dead plants and animals only can we determine the nature of their functions. The study of the results of disease processes in the post-mortem room cannot settle questions, he said, relating to the etiology of disease, its mode of transmission, if infectious, its clinical history or its treatment. These are questions which concern patient and physician, and scientific medicine depends upon their so-

lution by scientific methods, that is, by experiment.

Progress in the biological sciences calls for experiments on living things. The term vivisection originally related only to cutting operations upon living animals. Its use has been extended by those who have been led to enter upon a crusade against experiments on living animals, so that now it includes all experiments to which they are subjected.

Thus, said the speaker, the injection of bacteria under the skin of a guinea pig becomes vivisection. It is by experiments of this kind that our knowledge of disease germs has been acquired, and without such experiments it would be absolutely impossible to distinguish the harmless bacteria and the deadly germs of tuberculosis, cholera, typhoid fever, puerperal fever, anthrax and the like, which are now well-known in pathological laboratories.

Such experiments have resulted in an immense saving of human life, yet the anti-vivisectionists insist that they are unjustifiable, and would enact measures calculated to entirely arrest all profitable research in this most important department of human knowledge.

Continuing, General Sternberg said that when the dissection of dead plants and animals was first practiced there was great opposition to it on the part of those who did not realize what could be accomplished thereby. One great fault that has seriously retarded the progress of medicine is that there has been altogether too much deduction from insufficient data. This is proved in part in other departments of life by a curious feature of the times, the revival of interest in palmistry, faith cure and matters of that sort, and the absolute reliance which a great many people place in the virtues of patent medicines as panaceas for all ills. If one controverts the views of a believer in any of these he will be met by the recital of some particular incident, unsupported, which answers the purpose of absolute proof to the credulous. This sort of credence is not altogether lacking in the medical profession. Final conclusions cannot always be reached by chemical methods, but much must be done by hospital experiments. These often furnish extremely valuable additions to our scientific knowledge, but it is not always possible to carry these experiments sufficiently far. Fuller and more valuable results may often be obtained by experiments on the lower animals in the hands of a master.

He quoted, in support of his position, the story of one of Pasteur's experiments by means of which, sacrificing the lives of a few animals, he discovered the bacillus of anthrax, and thereby saved the lives of millions of animals. The fact that anthrax inoculation is now so generally practiced was due to Pasteur's work, which could never have been carried through without vivisection. Formerly ten per cent. of all the sheep and five per cent. of all the cattle in France died from this disease, and his study of the malady has resulted in a saving, in France alone, of 5,000,000 francs a year for sheep and 2,000,000 francs' worth of cattle. He also spoke of Pasteur's experiments on the subject of hydrophobia, pointing out the tremendous blessings which have accrued to the human race from the work of the famous French scientist, a work, however, which necessitated the sacrifice of a few animals. As a result of his experiments and study, mortality from hydrophobia among human beings has been reduced to less than one per cent. In a record of 416 cases of people who had been bitten by animals known beyond question to have been mad, treated by the Pasteur method, not one died.

Vivisection has resulted in a great increase in the exactness of medicine and surgery, and any further progress in biology calls for experiments upon living things. In the consideration of vivisection is placed on the one side the tremendous advance in science, the increased immunity from disease and the great saving to the material wealth of the world, while on the other side of the balance is the thought of the animals, comparatively few in number, which have been sacrificed. As human lives are too sacred to risk in solving the questions of pathogenic potency, we resort to lower animals, and vivisection has resulted in a great saving of human life. The painful dissections made by the early investigators, and necessary in the beginning, are rarely, if ever, made nowadays. The statements presented by the ultra anti-vivisectionists that unnecessary cruelty is used

and that many experimenters seem to take an actual delight in the sufferings of their victims, Gen. Sternberg characterized as a gross and unfounded calumny. Vivisection is practiced by members of the humane profession of science in the interest of humanity. Those who deny that any valuable results have ever accrued from vivisection simply show how ignorant they are, and only prove themselves fit subjects for a course of elementary lectures.

The discovery of anti-toxin is one of the blessings that has resulted from experiments upon the lower animals. Scientists would have to stop just where they are to-day if they were prevented now altogether from the practice of vivisection. In securing the anti-toxin, very little suffering is inflicted upon the horse, from which it is obtained, but it must then be tested upon guinea pigs to determine its character and potency. If we object to using guinea pigs for this purpose, then we are compelled to act blindly and must take our chances with the children.

In conclusion, Dr. Sternberg characterized as well meaning, but ill advised, the efforts of those people who seek, by organization, agitation, and in every other way to hinder or absolutely put a stop to a practice which is recognized as necessary to any further advance in scientific medicine.

Dr. Baker considered the question from the physiological point of view. He reviewed the history of the study of the human body from the earliest days down, showing the crude ideas which were entertained on the subject by Hippocrates and other physicians of long ago. He traced the development down to the present time, recounting the experiments which were necessary, and which were made from time to time, without which we would know no more of the functions of the human body than did Galen. Harvey was an enthusiastic vivisectionist, and if he had not been, he could never have discovered the circulation of the blood. That he did discover it resulted from the fact that he cut into the thorax and saw the blood coursing through the arteries and the heart beating. To ask scientists to study anatomy without seeing what is actually within the body would be precisely the same as to ask a man to study the mechanism of a mill by standing outside and listening to the noise of the spindles.

Dr. Salmon, Chief of Bureau of Animal Industry spoke of the role vivisection had played in the discoveries of, 1, Anthrax by Koch, 2, Chicken Cholera bacillus of Pasteur, 3, Immunity as first advocated by the Bureau of Animal Industry and 4, the discoveries and researches in Antitoxin based upon this doctrine. He also cited the million of lives and money saved by the investigations in pleuro-pneumonia, hog cholera, Texas fever and tuberculosis, which had become of international interest, due to the exclusion of our cattle from France to Germany.

Mr. Kennedy, of the Anti-vivisection Society, defined the term 'vivisection' so as not to include inoculation, and claimed that their purpose was to have governmental supervision over experiments, and based his arguments solely on sentimental grounds, claiming that since many experiments had failed therefore it was cruelty to animals destroyed in these unsuccessful attempts.

Dr. Ch. Wardell Stiles spoke of the utility and results of animal experimentation in comparative invertebrate zoölogy as applied to human and comparative medicine. He made the general statements. (1.) That all animals are infested with animal parasites. (2.) That some parasitic diseases may be treated successfully while others cannot; in this later case we must deal with *prevention* rather than *cure*. (3.) A study of the embryological phases of the parasites is necessary before we can establish satisfactory prophylactic measures. (4.) The data regarding the embryology including life-history can be obtained only through animal experimentation.

The speaker next cited some of the better known parasitic diseases of man and the domesticated animals and showed the various steps by which the zoölogist had placed the medical profession in a position to meet these maladies. *Trichine spiralic* (*Trichina spiralis*) was first described in 1835 as a harmless parasite; its life-history was discovered in 1850 but not until 1860 was it shown to be the cause of a well defined disease which up to that time had been confounded with typhoid fever. Its life-

history as well as the various prophylactic measures were discovered by experimentation and could have been obtained in no other way. The same is true regarding tape worms and flukes. Through a study of the embryology of these parasites by means of animal experimentation data have been obtained for the proper methods of prevention.

The study of animal parasites bears a close relation in differential diagnosis to the bacterial diseases, for verminous nodular diseases are found in cattle, sheep, chickens, etc., which resemble tuberculosis and are often mistaken for it.

Regarding anæsthetics Dr. Stiles said that they could not be used in his line of work as it was necessary to keep the animals under experimentation for several days, weeks or even months at a time. He was firmly of the opinion, however, that the inconvenience suffered by the animals in experiment was, in the vast majority of cases more of the nature of weakness than of actual physical pain. He claimed that the appetite of the animals was an excellent index to the amount of pain they suffered since an animal in severe pain refuses food. In experiments with animal parasites the hosts nearly always retained their appetites and the speaker maintained that even in the severe experiments the pain suffered by the animals was almost insignificant when compared with the pain a human being would suffer in the same stages of the same diseases.

J. H. McCormick,
General Secretary.

GEOLOGICAL SOCIETY OF WASHINGTON.

At the 45th meeting of this Society, held in Washington, D. C., March 11th, President S. F. Emmons in the chair, two papers were read, one by Bailey Willis on 'Evidences of Ancient Shores, and the other by David White on 'The Thickness and Equivalence of Some Basal Coal Measure Sections along the Eastern Margin of the Appalachian Basin.'

Mr. Willis discussed the evidences of ancient shores with reference to their position, trend and duration. Five classes of evidence were enumerated: namely, (1) overlap or unconformity; (2) suncracks, trails or ripple marks; (3) coarser deposits; (4) thicker deposits, and (5) synclines of deposition.

Any point of an unconformity marks with precision a point on some shore line at some instant of time, but as the outcrop of an unconformity cannot be assumed to be parallel to the former shore line, this evidence does not define the trend of the ancient shore, and as the shore was in transit its duration was transient.

In contrast with this conclusion was placed that derived from thick deposits of shales such as are formed by the delivery of a large volume of sediment concentrated at the mouth of a river draining an extensive watershed. These conditions result in the accumulation of a lenticular formation which thickens rapidly from the shore to a maximum and thins more gradually seaward. When the thickness of the shale is pronounced, the duration of the conditions was probably long continued. Such evidence, therefore, indicates the approximate position, general trend and long duration of the ancient shore.

In folded regions such conditions of deposition as have just been described have determined the positions of synclines of the greatest magnitude, the synclines of deposition. Such folds are further characterized by a very steep dip on the shoreward side and by the stratigraphy, which should include a massive bed of shale. When sufficiently characteristic to be recognized, the syncline of deposition thus becomes an evidence of proximation to shore, with axis parallel to its general trend; the infolded strata may also indicate the prolonged duration of the neighboring shoreline.

Thus the causal relation which exists between sedimentation and folding is appealed to, to aid in the determination of ancient shorelines.

Mr. David White communicated informally some preliminary results of his recent work under instructions from the Director of the Geological Survey in the stratigraphic paleontology of the lower portion of the Carboniferous proper (Mesocarboniferous) and of the Pottsville series in particular. The speaker exhibited columnar sections of the series near Coxton, Pottsville and Tremont, Pa.; Piedmont, the New River and the Tug River, W. Va.; Soddy, Tenn., and in the Warrior Coalfield, Ala., on which were

indicated the stratigraphic position and vertical extent of the paleontologic divisions of the Pottsville series.

Although the plant collections are often fragmentary or represent only one or more levels in some of the sections, the individual collections are generally clearly referable to one of the floral divisions, suggested in the author's preliminary paper on the New River section at the Baltimore meeting of the Geological Society of America, viz: Pocahontas, Horsepen and Sewanee, in ascending order, while the approximate level in that division is also frequently indicated with considerable reliability, as is shown by stratigraphic verification. The limits of these floral divisions, now fairly well determined in the New River section, have been traced through the Flat Top-Tug River section, where the total thickness is seen to expand far beyond the 1,700 feet of the New River section, while material from two localities in the Big Stone Gap, Va., region shows the presence of a flora belonging to the Sewanee division, at a probable height of 2,300 feet above the base of the series, denoting, perhaps, the maximum thickness of the series near this point in the central Appalachian trough.

Special importance attaches to the author's conclusions that the inclusion of the lower part of the 'Walden sandstone' of Hayes, represented by the 'Second Series' of Safford, in the upper or Sewanee division of the Pottsville series is fully demonstrated by the fossils of the West Virginia and the type (Pottsville) sections, while the underlying terranes, including the 'Millstone Grit' and upper part, at least, of the 'Sub-conglomerate' of Safford or the 'Lookout Sandstone' of Hayes are referable to the Horsepen division. Such scanty fossil material from Alabama as is available indicates that in the Warrior coalfield the Warrior and Black Creek seams belong in the Horsepen division, while the Newcastle and Pratt seams appear to fall within, certainly not above, the Sewanee division, though the Pratt seam is said to be about 1800 feet above the base of the series. Such a correlation necessitates placing the boundary of the Lower Productive Coal Measures many hundreds of feet higher in Tennessee and Alabama than has yet been done by the geologists in those States. It also follows that the Lykens Valley coals in Pennsylvania, the New River and Pocahontas coals of West Virginia, as well as the valuable coking coals of Tennessee and Alabama, all seem to fall within the limits of the Pottsville series.

Attention was also called to the absence of the Pocahontas and even the Horsepen division floras in some of the thin sections of the series in this basin, apparently disproving the generally accepted view that the difference between the thick and the thin sections is wholly a question of expansion.

Mr. M. R. Campbell described briefly the result of his recent stratigraphic work in the coalfield of Virginia and West Virginia. From New River to Big Stone Gap his correlations, based entirely upon stratigraphic work, agree essentially with Mr. White's correlations, showing that the two methods are harmonious and lead to the same results.

W. F. MORSELL.

ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA, MARCH 13, 1896.

ANTHROPOLOGICAL Section; Charles Morris, Recorder. Prof. T. Edge Kavanagh, of Ursinus College, spoke upon the subject of 'Right-Handedness.' It had been claimed that early man was ambidextrous, drawing of faces facing both ways being adduced in evidence of the fact; but on careful investigation this position had not been sustained. In primitive languages words associated or compounded with the word meaning left hand are symbolic of degeneration. Other data were given to sustain the view that primitive man was right-handed.

Bilateral asymmetry of the human body was not confined to the hand, but is the rule for the entire organism. The right eye was a little larger than the left, the right leg a little longer, the right tibia more calcareous, the right teeth stronger, hair and beard stronger on the right side, while sick headache attacked the left side, as did congenital and defective diseases. The evidence to be adduced from the movements of animals is too scant to be of much weight. The researches of Gratiotet and Brown-Sequard on the development of the human embryo were referred to. It had been suggested that the mat-

ter could be explained by the mechanical laws of the body: when the center of gravity is above the transverse median line, the person is right-handed; when median, ambidextrous; when below, left-handed.

Right-handedness he regarded as physiological and not the result of the evolution of a dextral habit. The left side of the brain controls the right side of the body and *vice versa*. The speech center is nearly always on the right side of the brain, the left speech center remaining undeveloped. He regarded right-handedness as a natural physiological development, and he therefore did not regard it as beneficial to cultivate ambidexterity.

Dr. Charles K. Mills thought it probable that in recovery from aphasia the loss of power in the speech center of the brain is not regained by a compensatory action of the other side, but through healing of the lesion in the diseased side. In children aphasia seems to occur equally from paralysis of both sides of the body; in adults from paralysis on one side alone. In aphasia from right-handed paralysis it is very difficult to teach writing with the left hand.

Dr. D. G. Brinton remarked that right- and left-handedness are not found in the anthropoid apes, and there is good reason to believe, from the formation of stone implements and modes of drawing of primitive man, that he was ambidextrous.

Prof. Jastrow stated that the farther back we go the less important the direction of writing becomes. In many ancient methods the writing might be done to right or left, according to the will of the writer. The same is the case with Chinese and Japanese writing. The earliest Greek inscriptions are written from right to left, the direction being changed at a later date.

Mr. H. C. Mercer did not think that the asymmetry of stone implements had any special significance. In stone chipping by modern Indians the grain of the stone largely governed the direction in which it is worked.

Prof. Heilprin called attention to the fact that Darwin had commented on the right-sidedness of a large proportion of animals.

Edw. J. Nolan,
Recording Secretary.

BOSTON SOCIETY OF NATURAL HISTORY.

A general meeting was held March 4th, thirteen persons present. Prof. F. W. Putman, in his remarks upon Symbolism in Ancient America, insisted upon the importance of studying Ceramic art from its earlist beginning. The form, color, and style of ornamentation of ancient vessels and utensils was deseribed, and the resemblances between the decorative and symbolic carvings throughout the world noted. Implements made of native copper with the simplest tools were mentioned; also ear and head ornaments made of copper. Carvings upon the round surfaces of human bones clearly indicate design. The designs, methods of carving, and the various meanings of the carvings were explained.

A series of detailed drawings by Mr. Willoughby were also explained. The symbolic tablets of the Pueblo peoples and of the Mound Builders show but slight differences.

The peculiar character of the pottery of the Florida sand mounds was noted. The age of the mounds is uncertain; they are probably more than 800 or 1,000 years.

Samuel Henshaw,
Secretary.

THE ACADEMY OF SCIENCE OF ST. LOUIS.

At the meeting of March 16th Mr. Trelease presented some of the results of a recent study of the poplars of North America, made by him for the Systematic Botany of North America, and exhibited specimens of the several species and recognized varieties. Specimens were also exhibited of an apparently undescribed poplar from the mountains of northern Mexico, which he proposed to characterize shortly, and, for comparison, specimens of the two other species of poplar known to occur in Mexico, and of the European allies of the supposed new species, were laid before the Academy. The paper was discussed by Drs. Green, Glatfelter and Kinner, Mr. Winslow and Professor Kinealy.

The Academy adopted resolutions favoring the appointment of a permanent chief for the scientific work of the United States Department of Agriculture.

William Trelease,
Recording Secretary.

Erratum: In Prof. Mills' article, page 442, paragraph 3, line 6, for 'smell,' read 'suck.'