

SCIENCE

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THE PROCEEDINGS AT THE CENTENARY OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

AN adequate celebration of the one hundredth anniversary of the academy was urged by the academy secretary early in February, 1911, and was entrusted to a general committee of forty-three. The celebration thus provided for extended over three days: the 19th, 20th and 21st of March. It began on the 19th because that was the stated meeting night of the academy, the 21st being the actual date of the anniversary. The lecture hall on the evening of the 19th was well filled with people, the front seats being occupied by delegates, who, to the number of one hundred and forty-seven, had been appointed by corresponding societies at home and abroad.

The president of the academy, the Honorable Samuel Gibson Dixon, M.D., LL.D., took the chair promptly at 8 P.M., and introduced the Honorable Rudolph Blankenburg, mayor of Philadelphia, who, in a few well-chosen words, cordially welcomed the visiting scientists to the city. The recording secretary, Edward J. Nolan, M.D., then requested the delegates, as the names of the societies they represented were called by the corresponding secretary, J. Percy Moore, Ph.D., to arise, bow, and hand their letters of credential and congratulation to the president without reading. As the exercises of the evening were likely to be lengthy, he asked that any remarks considered desirable should be very brief. Thus warned, as a matter of fact, no one spoke, and as much the greater number of the two hundred and eighty-six letters received from all parts of the world

had been already delivered by mail, this otherwise tedious part of the program was not unduly prolonged.

The president then delivered his historical address as follows:

ADDRESS OF THE PRESIDENT

Fellow Members and Guests: This is one of the occasions which stimulate reflection. To-day we must all feel a regret that we can not inherit the learning of those who have gone before us. So keen an appreciation do I possess of the unselfish devotion of my predecessors to science and to this institution, and so impressed am I at our monthly meetings in our reading room by the regard of their portraits hanging on our walls, that I am impelled to call upon them in spirit to join me in extending to our guests the heartiest of welcome and to say that we, the present workers, fully appreciate how much credit is due them for our present success.

To-day this City of Brotherly Love, with the mother commonwealth, Pennsylvania, in common with the great union of states, is in peace with all the nations of the globe. This blessed condition did not prevail on the day when our forefathers assembled one hundred years ago, to organize an institution for the study and advancement of the natural sciences. During the last days of the year 1811, the dispute between the United States and Great Britain and the doubt as to the attitude of France seemed to indicate that the national honor was hurt and that another contest with a European power was at hand. The commerce of the country had suffered. The Committee on Foreign Relations recited the wrongs that the United States had suffered from Great Britain, and declared it to be the sacred duty of Congress to call forth the patriotism and resources of the country. Extensive military measures were

recommended. The Pennsylvania Legislature passed acts for enlarging the regiment of artillery and for the organization of the cavalry of the city of Philadelphia. Although war was not declared until June, 1812, in anticipation of the necessities of the situation Congress approved a loan of eleven million dollars, of which one million six hundred and forty-five thousand dollars was raised in Philadelphia.

Large meetings of people took place all over the city to consider the needs of commercial interests and to pass resolutions for the equipment of privateers and for building up the defenses of the city.

The legislature relieved the tension of its patriotic resolutions by requesting a special committee to examine a machine made by Charles Redhefer, who claimed that it possessed the power of self motion, and naïvely stated that "if the machine be found to be imperfect the public interest will be promoted by exposing its fallacy."

In the midst of these excitements the youth of the city naturally sought the taverns and oyster cellars as meeting places, as indeed there was little in the way of diversion provided for the people of that period. The theater was seldom opened, and the feeling against it was so strong that a petition was presented to the legislature requesting it to abolish forever the exhibition of "Theatricals." Peale's Museum enjoyed great popularity, and here the *lusus natura* was in steady demand. The calf with five legs vied for public favor with the child without ears.

Notwithstanding the preparations for war which were draining the resources of all men, the fathers of this institution had such faith in the future of the United States of America that they did not hesitate, even with the din of martial demonstrations in their ears and the consciousness of an awful, impending struggle with

gigantic powers in their minds, to proceed quietly, methodically and unperturbed to found an association for pure learning which has now become one of the foremost among the scientific institutions of the world.

The vibrations, whose echoes still resound in this Hall of Science, though the voices that started them can no longer be heard, are too numerous to be mentioned on this occasion, when there is so much that is new to be brought out within the short time allotted for our assemblage for the last time in the academy's first century.

This institution was born of the enthusiasm of earnest lovers of science. They had before them a single purpose, the unveiling of the laws of nature and the engraving of them on the tablets of the society that they might be studied by men of all nations. To accomplish this great end as the society grew they realized the necessity of exploration, of collections, of laboratories, of a library and of reciprocity with bodies having similar aims.

In the beginning of the nineteenth century a few young men in this city spent their spare time in studying natural history. They soon learned it was to their mutual interest to meet to compare notes. In the year 1812 John Speakman and Jacob Gilliams agreed that it would be well to hold regular meetings; accordingly, they, with Drs. Gerard Troost, Jr., Nicholas S. Parmentier, Camillus Macmahon Mann and John Shinn, Jr., met at the home of one of their members on the northwest corner of Market and 2d Streets, on January 25, 1812. The minutes of this meeting set forth that their meetings would be for the rational disposition of their leisure moments. Their next meeting was held at a public house on Market Street near Franklin Place on the 21st day of March, 1812, at which time Dr. Samuel Jackson,

of the University of Pennsylvania, suggested the title of The Academy of Natural Sciences. The collection of the society at this time was represented by a few common insects, a few corals and shells, a dried toad fish and a stuffed monkey.

Thus established, the academy, with its constantly increasing resources, has been for one hundred years free for the use of all students of natural history.

The masters of science have come from all parts of the world to consult the great zoological, botanical, geological and ethnological collections which the accumulated labors of our members, during a century of activity, have brought together in our museum.

Writers and students of all grades have come to consult the wonderful natural-history library which the liberality of our members and the world-wide exchange of our own publications have enabled us to gather on our shelves.

Pupils from our schools have come under the guidance of their teachers to study and profit by the exhibits displayed in our public museum halls, while our specialists have delivered courses of popular lectures on the natural sciences under the auspices of the academy and the Ludwick Institute.

In every way within its power the academy has stood for a century as the advocate of the study of the natural sciences, advanced or elementary, pure or applied.

And this, our one hundredth anniversary, is a particularly happy birthday because our precious natural history library of volumes unexcelled in America, and our priceless collections of mammals, birds, reptiles, fishes, shells, insects, plants, ethnological and geological specimens unsurpassed in several of the departments and all of them rich in the type specimens of the early naturalists of America, having been for almost one hundred years exposed

to the danger of damage or destruction from fire, are now, through the intelligent liberality of the commonwealth of Pennsylvania, placed in a thoroughly fire-proof building.

The society has, however, never received state or city financial aid for maintenance, but has depended entirely upon the liberality of intelligent people, mainly of Philadelphia, to contribute the necessary funds to purchase land for our buildings, to publish the results of the scientific researches of our members, to fit out expeditions and of late years to pay meager salaries to the members of our scientific staff.

While we have thus built up fine study collections, it has been impossible to develop the popular exhibits that other sister institutions, rich in state and municipal appropriations, have been enabled to instal.

We have, however, kept our collections systematically arranged and have, during the last decade, had the satisfaction of seeing all our historical types and the numerous recent accessions placed in metal cases, impervious to light, dust or moth; which will insure them the longest possible life.

Our honorary corresponding membership now numbers about two hundred, composed of the greatest scientists of the period.

Biographical sketches of our officers and scientific workers who carried us through the last one hundred years are printed in our publications, and as we have so little time before us they can only be casually alluded to in this brief résumé of the academy's history. We are, however, proud of the escutcheon upon which the history of their lives is engraved.

Members of this academy have taken a very prominent part in explorations. Thomas Say was a member of the "Long Expedition" to the Rocky Mountains in 1819 and 1820 and was one of the first scientific men to become personally ac-

quainted with the vast natural history resources of the great west.

Nuttall and Townsend, thirty years after the Lewis and Clark expedition, crossed the continent to the mouth of the Columbia River, and then extended their explorations to the Hawaiian Islands, returning around the Horn. They brought home rarities of animal and plant life, many of which were unknown to science. These collections were placed in the academy's museum, then the chief repository for natural-history specimens in America and here they are still preserved.

When the United States government was organizing the famous Wilkes expedition of 1838, the academy was requested to nominate its scientific staff and two of its members eventually accompanied the party.

In the year 1850 one of our members, Edward Harris, financed and accompanied the great Audubon expedition up the Missouri River. Through his modesty, we were prevented at the time from making known the important part that he took in this expedition. Other members made possible the exploration of Duchailu in equatorial Africa.

We provided Dr. Kane with his outfit for systematic collecting in 1853 when he made his Arctic expedition. To-day we have in our collection his famous Esquimau dog, "Toodla," as well as numerous other specimens obtained by him. Specially interesting is the gigantic stuffed polar bear which stands in interesting contrast to the modern mounted specimen brought here by the Peary "relief expedition."

The Hayes expedition to the far north a few years later was also aided and endorsed by the academy.

Rear Admiral Peary, discouraged by his futile attempts to interest other institutions and governments in his proposed voyage of exploration to the north, came to us

with his proposition. He was generously received and a committee was appointed to arrange the expedition, which sailed on June 6, 1891, from Brooklyn, under the auspices of the academy, to explore the Arctic regions. On January 26, 1892, we authorized a relief expedition under the command of Professor Heilprin. On September 24, 1892, we officially met the relief expedition sailing up the Delaware River on the now historic vessel *Kite*.

Dr. Hayden, a member of the academy, when conducting the United States Geological Survey in the west, made up his scientific parties largely from our membership. The setting apart of the great national Yellowstone Park resulted from his numerous explorations. Every three years this institution bestows upon a distinguished geologist a gold medal called the Hayden Medal, an award which was founded by Dr. Hayden's widow.

The Pennsylvania Geological Surveys were also conducted by our academy members, Rogers and Lesley.

Our famous colleagues, Leidy and Cope, were the pioneers in describing the extinct animals from the wonderful deposits of the western states.

I may mention among the more recent expeditions the one under Professor Heilprin to Yucatan and Mexico in 1890, the Harrison and Hiller expedition to Sumatra, the numerous explorations of Mr. Clarence B. Moore, the Rhoads expeditions to British Columbia, Colorado and Ecuador, the Donaldson-Smith expedition to Somaliland and Lake Rüdolp, and the Bond expedition to Venezuela, from all of which we have received rich returns.

The academy publications had early a world-wide reputation. For many years they furnished the only adequate means through which American scientists reached the naturalists of the world. Contributions

for publication came from all parts of America. To-day our *Proceedings* and *Journal* are exchanged with all the nations of the civilized world. It may be interesting to state here the fact that when the famous Pacific railroad surveys were made the United States government published descriptions of all the new specimens it obtained in the academy *Proceedings*.

Passing rapidly over the more important departments of our museum, we find among mammals a number of the specimens obtained by Townsend in the far west, made known to science in our *Journal* by our correspondents Audubon and Bachman; the Harrison Allen collection of bats, the Rhoads collection of North American mammals and the splendid collection of anthropoid apes presented by Dr. Thomas Biddle.

Our collection of birds will ever stand as a memorial to two of our members, Thomas B. Wilson and John Cassin. To Dr. Wilson's liberality we owe the acquirement of the famous Rivoli collection, the Gould collection and many others. His entire gift, comprising some 25,000 specimens, was regarded in 1850 as the finest collection in the world. Cassin spent his life in the study of this vast collection and his researches published in our *Proceedings* made our academy famous as an ornithological center, while he himself stood preeminent among the ornithologists of America.

The part that the academy played in the development of ornithology in America may be appreciated by the mere mention of those who worked within its walls or published the results of their researches in the *Proceedings*—Nuttall, Bonaparte, Townsend, Gambel, Heermann, Harris and Woodhouse, among our members, and Baird, Lawrence, Henry and Coues, among our correspondents.

In our vast series of reptiles, we find the material collected and studied by Hallowell,

Cope and Brown—names inseparable from the history of herpetology in America.

In the study of fishes at the academy the names of Bonaparte and Cope, already mentioned in other connections, stand forth prominently and their collections are still carefully preserved. Charles Lesueur, one of our earliest members, also attained fame as an ichthyologist, while of late years several of those who studied at the academy have become famous in the service of the United States Fish Commission—notably John Adam Ryder.

As regards mollusks, the academy has from its foundation taken a prominent part and has accumulated a collection probably second to none. A series of investigators, eminent in their special field, have made the society one of the world centers in the study of mollusks.

Almost a century ago Thomas Say blazed the trail for conchologists, while Dr. Isaac Lea and T. A. Conrad were his successors in the academy in this department. Lea's work, largely published by the academy, is the basis of all later systematic study of fresh-water mussels, while to Conrad we owe the foundation of American tertiary geology and paleontology, his work in this line overshadowing that on the living mollusca. Gabb was another famous worker in the same field, while to Geo. W. Tryon we owe the conception of the "Manual of Conchology," begun by him in 1878 and continued by the academy after his death in 1888. Very few works have led to so many reforms in classification or have such a broad influence as this. Dr. Joseph Leidy, who may be termed the Cuvier of America, should be mentioned in this connection because of his work forming the first volume of Binney's "Terrestrial Mollusks of the United States," published in 1851. This was the first American work on the morphology of the soft parts of our mollusks.

Thomas Say, already referred to as a pioneer conchologist, is also known as the father of American entomology. Owing to his energy, the academy's collection in this department was begun—a collection which by steady growth has reached a total of a million specimens and has become of world-wide renown. The long list of entomologists who have contributed to its development contains most of those whose activities constitute the earlier history of entomology in America.

Titian R. Peale, Wilson, LeConte, Horn, McCook, Cresson, Martindale and others have made our entomological department one of the first importance. The Cresson collection of hymenoptera has made the academy the greatest in America in this particular branch. The Bassett collection of galls and gall insects is the most comprehensive ever brought together.

In paleontology the names of Leidy and Cope are preeminent. The "Extinct Fauna of Dakota and Nebraska," published by Dr. Leidy in our *Journal*, is a classic. Students of paleontology still come to consult the types of his descriptions, most of which are preserved in our collection.

Professor Cope's part in the development of American paleontology is too well known to require detailed mention and was carried on side by side with his studies of reptiles and fishes, in which his reputation was equally great. On his death-bed he placed the finishing touches to his report on the pleistocene remains discovered at Port Kennedy, Pennsylvania, a paper which attracted the attention of the paleontological world and which appeared in the *Journal* of the academy soon after his death.

In botanical research the academy has always held an important place and its herbarium, now numbering some 900,000

specimens, contains the types of such pioneers as Nuttall, Pursh, Muhlenberg and de Schweinitz besides comprehensive collections from all parts of the globe. Among those whose researches have been carried on at the academy may be mentioned, in addition to the above, Durand, Charles E. Smith, Meehan and Redfield.

In anthropology the work of Morton and later of Harrison Allen is famous. The splendid collection of human crania brought together by the former is historic. Archeological and ethnological collections comprise the material gathered by S. S. Haldeman in North America and the land of the Aztecs, Mayas and Incas.

We have also the Wm. S. Vaux collection, rich in specimens of the neolithic age of Europe, the Robert H. Lamborn collection and the Clarence B. Moore collection.

This latter represents the results of more than twenty years' exploration in the southern United States and consists of thousands of specimens of the vanished art-industries of our southern aborigines now saved for all time in our museum and in the fine series of reports published in our *Journal*.

We have extensive mineral collections, foremost among which is the Wm. S. Vaux collection, famous for the beauty of its specimens and the completeness of the series.

There are the famous Febiger collection of diatoms and others, which lack of time forces me to pass over.

So, too, there are many former members of our academy who by their scientific attainments or their loyal and generous support have helped to build up the institution, while among our living members are men who are, by their work and devotion, fully as deserving of notice as those who have gone before.

Helmholtz, in 1862, said:

In fact men of science form, as it were, an organized army, laboring on behalf of the whole nation, and generally under its direction and at its expense, to augment the stock of such knowledge as may serve to promote industrial enterprise, to increase wealth, to adorn life, to improve political and social relations and to further the moral development of individual citizens. After the immediate practical results of their work we forbear to inquire; that we leave to the uninstructed. We are convinced that whatever contributes to the knowledge of the forces of nature or the powers of the human mind is worth cherishing, and may, in its own due time, bear practical fruits, very often where we should least have expected it.

It has been truly said that the distinctive feature of pure science is "that it is not remunerative; the practical rewards and returns are not the immediate ends in view." The work of Tyndall and Pasteur, however, on fermentation, pursued in the beginning purely because of its abstract scientific interest, later came to have enormous economic importance and led to the scientific investigations that have within recent years become of incalculable value to mankind.

The knowledge gathered by the abstract naturalist and the tabulation of scientific data concerning all forms of animal and vegetable life have a very close and direct relation to public health and preventive medicine. A long list of diseases might be compiled in which some of the insects are directly responsible for the transmission of the bacterium or parasite life causing disease. It is now a matter of almost universal knowledge that malarial fever is transmitted from man to man by means of the *Anopheles* mosquito, that the yellow fever virus can only be transmitted by the *Stegomyia calopus*, that the bubonic plague may be transmitted from man to man or from rat to man by means of the rat flea (*Pulex cheopis*), that the *Trypanosoma gambiense* of African sleeping sickness can be transmitted only by means of the tsetse-

fly, that the organism causing human filariasis is transmitted by the *Culex fatigans* and certain of the *Anopheles*, and evidence is gradually accumulating that the germ of leprosy is transmitted by the bed-bug (*Cimex lectularius*). A knowledge of the natural history of these insects is absolutely essential for the scientific study of the diseases with which they are so closely associated, and public health work has only been effective in eradicating these diseases in proportion to the efforts of the sanitarian directed toward their destruction or toward protecting individuals from them. The entomologist, the zoologist and the bacteriologist are each required to contribute their share in the research that means so much to public health and to mankind. If much has already been accomplished, still greater are the fields open for scientific investigation.

With the lower forms of animal life parasitic to man and known to cause disease, the connecting link, the intermediate host, the full life history is missing in many instances where it would seem that the most fertile field for the scientist has not yet been invaded. A very large field lies open for those who will undertake a careful study of the relation between the vermes and the human being. Much indeed has been learned about parasites inhabiting the intestinal canal, but the parasitologist has not yet concluded the final analysis of the life history of many of these parasites.

The work of the academy has been so distinctly pure science that the lay public have not until recently appreciated the great practical relationship it has to health and economics. The description of the various species, their life history, their geographical range, have enabled those working in applied sciences to conduct the already successful war against the enemies

to man, to the lower animals and to plant life.

Economic entomology, based upon abstract work, shows an annual money loss occasioned by insects as follows:

Cereals	\$300,000,000
Hay and forage	66,500,000
Cotton	85,000,000
Tobacco	10,000,000
Truck crops	150,000,000
Sugars	9,500,000
Fruits	30,000,000
Farm forests	11,000,000
Miscellaneous crops	10,000,000
Animal products	300,000,000
Natural forests and forest products .	100,000,000
Products in storage	200,000,000
Total	\$1,272,000,000

Let it be remembered that in 1793 half the population of Philadelphia either died from yellow fever or voluntarily exiled themselves to escape from the scourge, that all the southern tier of states were kept in a state of constant terror every summer for fear of its invasion, causing a loss of millions to the commerce of the country, and then recall the fact that through entomological and medical cooperation this disease was practically eliminated from Cuba, its breeding place for ages, and that in 1905 a violent epidemic of the same plague was actually checked in New Orleans by the practical application of the knowledge gleaned by the medical department of our army in Cuba.

That mysterious blight to human life and energy, known as malaria, to which, as much as to the fire and sword of northern barbarians Greece and Rome owed their downfall, has been traced to its entomological source so that these two devastating diseases have ceased to be a menace to civilized communities, allowing that great work, the construction of the Panama Canal, heretofore impossible owing to their prevalence, to go on uninterruptedly under

conditions of unparalleled health, that the sacrifice of 5,000 American troops during the Spanish-American war was finally found to have been due to the transmission of bacillus typhosus by the common house fly, and that this knowledge was so judiciously applied by our army surgeons that a recent considerable mobilization of our soldiers was entirely exempt from that disease, and some faint conception will be reached of the immense debt that humanity owes to the patient workers in the field of pure science.

President George Washington, in his first message to Congress, said:

Nor am I less persuaded that you will agree with me in the opinion that there is nothing more deserving your patronage than the promotion of science and laboratories, knowing in every country it is the surest basis of public happiness, one in which the measures of the government receive their impressions so immediately from the sense of the community as ours it is proportionately essential.

The mass of congratulatory letters with their autographs of our foreign co-workers received from the great institutions of the world relating to this our one hundredth birthday, can not be read, owing to a lack of time.

Before closing I have a pleasant duty to perform in behalf of the Building Committee. At the request of those entrusted with planning and erecting the building improvements, made possible by the commonwealth of Pennsylvania, as chairman of said committee, I hand over to the corporate body, under the title of The Academy of Natural Sciences of Philadelphia, this building completed for its use, which comprises fire-proof stacks for its library, a reading room, lecture hall and work room. In the rhythmic language of another, I reverently invoke the blessings of the God of Nature upon this temple of the natural sciences.

Great God of nature, let these halls
The hidden things of earth make plain;
Let knowledge trumpet forth her calls,
And wisdom speak, but not in vain.

Help us to read with humble mind,
Thy larger scriptures day by day—
True bread of life! O be thou kind,
If, erring, we should go astray.

For deep resounding unto deep,
Declares the wonders of thy plan;
Life struggling from its crystal sleep
Finds glorious goal at last in man.

The mysteries of the eternal laws,
Are but the shadows of thy might.
God, ruling all in final cause,
Enshrines the world in love and light!

—Harvey Watts

At the conclusion of the address it was explained that the routine of a stated meeting would then go on, in the belief that an illustration of the formula by means of which the academy had transacted its business for one hundred years would be of interest to those familiar with the results which made it worth while to hold the celebration on which they were entering.

At the call of the chair the recording secretary read the minutes of the last meeting, and also the minute of the first recording secretary, Dr. Camillus Macmahon Mann, an exiled Irishman, defining the date of the foundation of the society. The latter is as follows:

Year of the United States the 37th,
March 21st.

In committee agreed: The year of the Institution shall commence at the present natural evolution: the spring equinox, 21st of March and the year shall be named according to the era of the United States of America in the principle city of which we assemble.

Additions to the museum and library were announced.

The corresponding secretary reported on the letters received.

The report of the council, confined almost entirely to a consideration of the ar-

rangements for the celebration, was read.

The publication committee reported the titles of papers presented for publication since the last meeting, and also announced the details of works to be issued in connection with the centenary celebration: a quarto volume of memoirs, an index to the entire series of the *Proceedings* and *Journal*, and a detailed history of the academy by the recording secretary, which will make a volume of not less than 400 pages and to which the "Short History" contributed to the Philadelphia Founders' Week Memorial Volume may be regarded as a prodromus.

The chair reported the death that morning of Thomas Harrison Montgomery, Ph.D., the director of the zoological department of the University of Pennsylvania. The occurrence supplied a pathetic note to the proceedings, as Dr. Montgomery had been deeply interested in the arrangements for the celebration, had been assigned a place on the program of exercises, and had contributed the first paper, under the title "Human Spermatogenesis, Spermatocytes and Spermiogenesis" to the commemorative quarto volume.

At the place where "verbal communications" are usually called for, Dr. Nolan, under the title "Reminiscences," spoke of his connection with the academy as assistant librarian, librarian and recording secretary during the past fifty years, his earliest record of accessions to the library being dated February 4, 1862. He deeply regretted that he had not taken advantage of his acquaintanceship with certain contemporaries of the founders, who were still alive when he entered on the scene, such as George Ord, Jacob Peirce, Isaac Hays and Titian R. Peale to make notes of their recollections of the early days, but it could readily be believed that in his most sanguine moments he had never contemplated the possibility of being called on fifty years

later to record his regret before such an audience. He then spoke of the beginning of his work as an untrained assistant in the library and the unvarying kindness and consideration he had experienced from all the men met with at that time, but especially from his dear chief, J. Dickinson Sergeant, and his beloved future preceptor, Joseph Leidy.

It was an extraordinary epoch in the history of the academy, the beginning of its second half century, and the boy was associated with a stimulating group of men, including Leidy, Cope, Conrad, Tryon, Lea, Slack, Rand, Cassin, Heermann, Meigs, Gabb and Wilson, all men of marked individuality, some of whom have made permanent records as leaders of science in America.

Continuing, Dr. Nolan gave his impressions of some of his contemporaries of later date—Allen, Horn, Meehan, Ruschenberger, Ryder, McCook, Heilprin, Chapman, Isaac Jones Wistar and Arthur Erwin Brown—not by any means dealing in laudation exclusively, but indulging in kindly personalities in a belief that a more intimate tone than would be entirely desirable in a published record would not be disagreeable to his auditors, many of whom were familiar with the work of the men whom he was describing.

In the one hundred years of the academy's history four men had stood out prominently, with, of course, scores of associates, as dominant in its material and intellectual advancement. These were Thomas Say, Samuel George Morton, Joseph Leidy and the present chief executive. The work of Say, Morton and Leidy formed part of the history of the academy, and if impression were desired of the accomplishments of Samuel Gibson Dixon they had but to look around them.

Closing his remarks the secretary was

distressed to remember the names of the many dear friends whom, for lack of time, he was forced to leave in the undesirable class "and others."

Those whom he had known during the first years of association with the academy were nearly all dead. The old building, if it still existed, would be full of ghosts and even in the present halls, in the dusk of the winter days, dear shades encountered him in the alcoves and passageways and reminded him of the time when he too should be a tradition.

In conclusion he remarked:

But in the meantime it is with feelings of profound gratitude that I bear testimony to the kindly patience and sustaining encouragement of those who are still with me and who impart to the performance of the daily task much pleasure and little or no pain.

For obvious reasons I can not deal in personalities in the case of my living contemporaries, but I am at liberty to say that they are worthily taking the place of those who have labored so loyally for the advancement of the academy and who, we are not forbidden by the highest reason to hope, are now rejoicing in this splendid commemoration of their labors. Had they lived when men cherished the same truths under different formulæ their motto would have been *Ad maiorem Dei gloriam*.

May the men who come after us be as zealous and as disinterested in the development of truth as those whom I have been so ineffectually remembering to-night, so that when the second centenary is celebrated it also may be the subject of congratulation for a like gathering of kindly and appreciative friends.

Nominations for membership were read, the elections of those formerly proposed being deferred until the next meeting.

The rough minutes were then read for criticism and approval, as had been the custom for nearly one hundred years, the secretary explaining that he had complied with the directions of Dr. Mann and dated the record as having been made in the 137th Year of the United States. No cor-

rections being called for, they were adopted as read and the meeting adjourned until the following morning at 10 o'clock.

Wednesday morning, March 20. The day was sparkling, bright and genial and the hall was filled with delegates, members and visitors when Dr. Dixon dropped the gavel at 10 o'clock. The following papers, most of which were résumés of communications presented for publication in the commemorative volume, were then read:

Edwin G. Conklin, Ph.D.: "Experimental Studies on Nuclear and Cell Division."

Carlotta J. Maury, Ph.D.: "A Contribution to the Paleontology of Trinidad." The memoir will be illustrated with superb drawings of fossils from the accomplished pen of Professor Gilbert D. Harris, of Cornell University.

W. J. Holland, Ph.D.: "David Alter, the First Discoverer of Spectrum Analysis," with exhibition of the prism used by him.

John W. Harshberger, Ph.D.: "The Vegetation of the Banana Holes of Florida," well illustrated by lantern views.

Frederick W. True, M.S., LL.D.: "A New Species of *Delphinodon*."

Henry H. Donaldson, Sc.D., Ph.D.: "The History and Zoological Position of the Albino Rat."

Edward B. Meigs, M.D.: "The Ash of Smooth Muscle."

Marshall Avery Howe, Ph.D.: "Reef-building and Land-forming Seaweeds," illustrated by views and specimens.

At the conclusion of Dr. Howe's paper the audience adjourned to the new geological hall—the old library hall transformed—where a liberal luncheon was enjoyed.

The meeting reassembled at 2:30 P.M., when Benjamin Smith Lyman read a paper on "Natural History Morality." It was followed by the following:

Jacques Loeb, M.D., Ph.D.: "Experiments on Adaptation of Animals to Higher Temperatures."

Henry Skinner, M.D., Sc.D.: "Mimicry in Butterflies."

Spencer Trotter, M.D.: "The Faunal Divisions of Eastern North America in Relation to Vegetation."

T. Wayland Vaughan, Ph.D.: "Rate of Growth of Stony Corals," illustrated with lantern slides.

Henry A. Pilsbry, Sc.D.: "On the Tropical Element in the Molluscan Fauna of Florida."

The session closed with illustrations by means of a superb collection of lantern views, of methods of bird photography by William L. Baily.

In the evening a reception was tendered the delegates by Dr. Dixon, Mrs. Dixon and Miss Dixon in the Bellevue-Stratford Hotel. In common with everything else on the program it was brilliantly successful.

The weather Thursday morning was a violent and most undesirable change from that of the day before, a fall of snow being driven along by penetrating winds. It was a most gratifying evidence of the earnestness and interest of those attending the sessions that little falling off in the attendance was observable when Dr. Dixon called the meeting to order a few minutes after ten.

He opened the proceedings by referring to the death of Dr. Montgomery, who had been placed first on the program of that session. His place was taken by Edwin J. Houston, Ph.D., who made an interesting communication on "How the Natural Sciences can be made Attractive to the Young."

In continuation the following papers were read:

James A. G. Rehn: "The Orthopteran Inhabitants of the Sonoran Creosote Bush."

Merkel H. Jacobs, Ph.D.: "Physiological Characters of Species."

Henry F. Osborn, LL.D.: "Tetraplasy, or Law of the Four Inseparable Factors."

George Howard Parker, Sc.D.: "Sensory Appropriation as Illustrated by the Organs of Taste in Vertebrates."

John M. Macfarlane, Sc.D.: "The Relation of Protoplasm to its Environment."

William H. Dall, A.M., Sc.D.: "Mollusk Fauna of Northwest America."

The time having arrived for luncheon,

two papers were deferred to an afternoon session not provided for on the printed program.

On reassembling at 2 o'clock, Henry G. Bryant, LL.B., read a paper on "Governmental Agencies in the Advancement of Geographical Knowledge in the United States," and the scientific sessions concluded with a superbly illustrated and most interesting lecture by Witmer Stone, A.M., the ornithological curator of the academy, on the "Fauna and Flora of the New Jersey Pine Barrens." The communication was specially enjoyed by those from a distance as imparting in a most pleasing manner information regarding a region of quite unusual physiographical interest.

The rest of the afternoon was devoted to a demonstration of the resources of the museum and library, including a fine display of one hundred and thirty-two microscopes and an exhibition of a portion of the academy's superb collection of butterflies.

In the evening one hundred and sixty members and guests sat down to a banquet in the exquisitely decorated new geological hall, formerly occupied by the library. The occasion will long be remembered as a specially enjoyable one by those present.

Dr. Edwin G. Conklin, professor of biology in Princeton University and one of the vice-presidents of the academy, was an inimitable toastmaster and at his call appreciative speeches were made by the mayor, who sat on the right of the president; Mons. Jean de Pulligny, director of the commission of French engineers to the United States; Dr. Henry Fairfield Osborn, president of the American Museum of Natural History, New York; Dr. Dixon; Dr. Theodore N. Gill, of the Smithsonian Institution; Dr. William J. Holland, of the Carnegie Museum of Pittsburgh, and Dr. Nolan, all bearing testimony to the acad-

emy's influence as a source of inspiration and encouragement.

The celebration of the one hundredth anniversary of the institution which had produced such a marked effect on the progress of science in America finished with the singing of "Auld Lang Syne," the departing guests sympathizing with those who were unable to participate in the hearty and genial conclusion of a program which was unanimously declared to be a complete success.

*THE MISUSE OF LANTERN ILLUSTRATIONS BY MUSEUM LECTURERS*¹

THE illustrated lecture has long been a very prominent feature of the educational and scientific work of the public museums of this city. It has long been a feature of the meetings of clubs and societies of all kinds, not so much for instruction as for popular entertainment.

So general is the use of lantern illustrations at all sorts of gatherings, that it has become commonplace. It is necessary for the legion of lecturers who employ them to procure better, and yet better pictures, to make their performances attractive. We appear to be in the midst of a great rivalry as to who can make the finest pictorial display, and anybody, apparently, may occupy the platform.

At a recent meeting of ornithologists in Philadelphia, I sat for many hours watching a continuous performance of stereopticon lecturers. Some of them did their parts remarkably well, but the three-days meeting was manifestly, although unconsciously, a lantern-slide competition. During the intermissions, the audience, composed chiefly of professional ornithologists, talked almost entirely of the admirable pictures that had been shown, making animated comparisons of the success achieved by this or that photographer.

There have come among us hosts of skilful photographers or enthusiastic travelers, back

from hasty trips to Zuñi or East Africa, ready to exhibit the best of pictures, to any kind of an audience that they can get, and to talk more or less amusingly while doing so.

Many of these so-called lecturers are successful enough, and audiences are forthcoming anywhere from the Museum of Natural History to the Suburban Entertainment Club. Even Peary's colored cook is doing a rattling lecture business with his master's slides.

Good pictures are dangerous in the wrong hands. Imagine a dull and dreary talker, still talking in public if he were deprived of lantern slides.

The use of lantern slides should be on a safer basis. They should not only be reduced in number, but be partially replaced with something more intellectual.

There could be no objection to lantern pictures as an inexpensive form of entertainment, if it were understood to be chiefly for entertainment, but when a fine collection of pictures of the Grand Cañon, accompanied by the talk of a mere traveler, is announced as a lecture on geology, it is a sign that we are losing our powers of discrimination.

When some superb pictures of Indian habitations on the table-lands of the southwest are described by a mere photographer engaged in making money out of the lantern slides, shall the authorities of the great museum allow the performance to be advertised as a lecture on ethnology? The City Bureau of Free Lectures employs a legion of lantern slide lecturers on travel, some of whom doubtless have never visited the lands they describe in glowing terms. There are art lecturers in this city showing colored photographs of the great paintings of Europe, who have never seen the originals. I am not undertaking to condemn the work of the free lecture bureau. It doubtless affords thousands of people entertainment that is wholesome and not without instruction.

Some of the lecturers make a specialty of describing the wonders of the Art Museum, or the Aquarium, and I personally shouldn't care to lose that much free advertising for my own institution. No doubt the pictures

¹Part of a paper read at a meeting of curators of the public museums of New York, December 19, 1911.