Foulke (Wm P.)

DISCOURSE

IN

COMMEMORATION OF THE FOUNDING

OF THE

ACADEMY OF NATURAL SCIENCES

OF PHILADELPHIA.

BY

WILLIAM PARKER FOULKE.

DELIVERED, MARCH 20, 1854,

IN THE HALL OF THE UNIVERSITY OF PENNSYLVANIA.

PHILADELPHIA:

PRINTED FOR THE ACADEMY.

1854.

C. SHERMAN, PRINTER,
19 St. James Street.

Among the earliest acts of the founders of The Academy of Natural Sciences of Philadelphia, was a resolution that its origin should date from the 21st day of March, A.D. 1812; and that its anniversary should be held on that day.

During the interval between the years 1812 and 1854, the anniversary had been permitted to pass unnoticed; but on the 31st day of January, 1854, it was determined that in order to celebrate it, the Members and Correspondents should be invited to meet at dinner on the 21st day of the following March; and also, that a public discourse should be delivered upon the occasion before the Academy and the Citizens of Philadelphia.

The Trustees of the University of Pennsylvania having granted their Hall for this purpose, the following Discourse was there delivered, in the presence of a large and intelligent audience of both sexes, on the night of Monday the 20th of March.

On the next day (21st), many Members and Correspondents, with some guests, assembled at dinner in the Musical Fund Hall.

The Committee charged with the celebration had the gratification of reporting that during its course they did not become aware of any occurrence to excite regret; and that kindness and satisfaction were manifested by all.

CORRESPONDENCE.

HALL OF THE ACADEMY OF NATURAL SCIENCES,
PHILADELPHIA, March 28, 1854.

WM. PARKER FOULKE, ESQ.

DEAR SIR :—At a meeting of the Academy, held this evening, the following resolutions were unanimously adopted :—

Resolved, That the thanks of the Academy be presented to Wm. Parker Foulke, Esq., for the able, eloquent, and highly appropriate Address delivered by him at the Hall of the University, on Monday evening, 20th inst., in Commemoration of the Founding of the Institution.

Resolved, That a committee of three members be appointed to request a copy of the Address for publication.

In accordance with the second Resolution, the undersigned were appointed the Committee; and cordially uniting with their fellow-members in expressing the gratification which they derived from your Address, they hope that you will comply with the request of the Society.

Very respectfully,

Your obedient servants,

WM. S. ZANTZINGER,
AUBREY H. SMITH,
WM. S. VAUX.

PHILADELPHIA, March 29th, 1854.

GENTLEMEN :—

As the Anniversary Celebration of the Academy was designed mainly to promote good relationship among its members, and between them and their fellow-citizens of Philadelphia, the public Discourse delivered upon

the occasion was expected to be less studied than would have been required for a more formal and scientific exhibition. This understood, I can have no hesitation in placing the manuscript at your disposal, although it was almost wholly prepared during the four days next preceding its delivery. I have taken the liberty of adding a single paragraph.

I beg to tender through you to the members of the Academy, my thanks for the friendly manner in which they have received the performance of the duty assigned to me, and to assure you of the respect with which

I am, gentlemen,

Your obedient servant,

WM. PARKER FOULKE.

To DR. WM. S. ZANTZINGER,
AUBREY H. SMITH, ESQ.,
WM. S. VAUX, ESQ.,
Committee.

DISCOURSE.

Mr. President,—

Fellow-Citizens:—

If the object of the address about to be made to you, were to exemplify, by a formal essay, the research or the learning which have raised The Academy of Natural Sciences of Philadelphia to its actual position amongst the scientific institutions of the world, there might have been selected many members whose rank as cultivators of natural history would have entitled them to precedence of your speaker, upon an occasion such as that which assembles us to-night. A different motive has determined the choice which has been made. Forty-two years have passed since the foundation of the Academy—years of patient industry and increasing fruitfulness. In your midst, our institution has risen from almost hopeless obscurity to a well assured eminence. It has not depended for its encouragement upon your

sympathy; nor for its support upon your patronage of its members. These have sacrificed to it intervals of leisure from professional toil, which are to most men periods of recreation or repose; from scanty means of livelihood, many of them have devoted to it a generous portion. At length they witness a success upon which they may, without undue pride, exchange public congratulations. They have constructed a HALL, the full proportions of which have just been completed, in which they display a collection of materials for natural history, not equalled in the western hemisphere. They have established publications which already take rank with the foremost of Europe. Their institution has become important to your means of knowledge and of wealth, and to the reputation of your city and your country. Upon the anniversary of their foundation, they tender to you an invitation to contemplate these happy results, and to share the sympathies of this occasion. For the honorable duty of presenting to you this invitation, they have commissioned one who, like yourselves, is rather a debtor than a contributor to their work; and who, recognizing with yourselves this common relationship, may the more appropriately express the common sentiments which must be excited by it.

Such being our respective positions, it will probably best promote the design of our first public meeting, to retrace some of the principal steps by which, from its humble beginning, the Academy has made its way; to consider what are its present and prospective means of usefulness; and to impress upon our minds the special relations in which it stands to our own community. Let us, therefore, briefly review the HISTORY OF THE ACADEMY—its UTILITY—and OUR OWN DUTY TOWARDS IT. You will not expect upon topics so extensive, more than the most cursory observation. You will not expect upon topics so interesting, that the speaker shall employ any elaborate arts of diction. The honest exultation of those who now behold the triumph of their self-sacrificing labor, and your own approval of its results, will give the most fitting illustration to the narrative before us.

To the shop of an apothecary, at the northwest corner of Market and Second Streets, we are to look for the origin of the Academy of Natural Sciences of Philadelphia. Mr. John Speakman, the proprietor, is represented as a person having a strong disposition to acquire a knowledge of the laws of nature, and as seeking the conversation of intelligent persons who frequented his

place of business, which became "a centre of literary and scientific gossip." One of his visitors, who, like himself, was interested in the researches of scientific men, without giving his own attention to the methodical cultivation of any branch of natural science, was Mr. Jacob Gilliams, a dentist. "At one of the accidental meetings alluded to," says Dr. Ruschenberger (to whom we owe a valuable memoir upon the Academy), "Mr. Speakman suggested that if they and their acquaintances could be induced to meet together at stated times where they would be secure from interruption, to communicate to each other what they might learn about the phenomena of nature, they would derive more pleasure and profit than from desultory and irregular conversations. Mr. Gilliams enlarged upon the suggestion. No doubt was entertained of the propriety of forming an association, the members of which should devote their leisure to study natural history. Before the two friends separated, it was agreed they should meet on the following Saturday evening at the residence of Mr. Speakman, and each should invite such of his friends as might be found on consultation, favorable to the formation of the proposed society. On the evening of the 25th of January, 1812, in accordance with the engagement

above stated, Dr. Gerard Troost, Dr. Camillus McMahan Mann, Messrs. Jacob Gilliams, John Shinn, Jr., Nicholas S. Parmentier, and John Speakman, assembled at the residence of the gentleman last named." Of this party only one, viz., Mr. Gilliams, survives. Mr. Speakman, a few days since, was carried to his last resting-place. The meeting was described in the minutes as one "of gentlemen, friends of science, and of rational disposal of leisure moments." Several meetings were held during the months of February and March, a few of which were at a public house near the corner of Market Street and Franklin Place, known as "Mercer's Cake-shop." It was on the 21st of March that the present title "Academy of Natural Sciences," was first employed in the minutes; it having been adopted upon the suggestion of Dr. Samuel Jackson, one of the Professors of the University within whose walls we are now assembled. "On this occasion the members pledged themselves to a mutual support in all things pertaining to establishing an academy of natural sciences; and to share the expenses and responsibility which might accrue. They agreed to contribute to the formation of a museum of natural history, a library of works of science, a chemical experimental laboratory, an experimental

philosophical apparatus, and every other desirable appendage or convenience for the illustration and advancement of natural knowledge, and for the common benefit of all the individuals who may be admitted members of our institution."

It is impossible to read without admiration the record of so comprehensive and liberal a design, conceived in such circumstances. The little company of adventurers were not deceived in relation to the magnitude of their undertaking; nor did they undervalue the difficulties against which they must contend. Although their Society numbered only six members at the end of three months from the time of its first proposal, you shall hear how brave a zeal animated them, and how worthy they were of whatever honor we can give to their memory by our public testimony on this day of formal commemoration. "We cannot dissemble to ourselves," said they, "that unless we take upon ourselves among our very small number, a responsibility as to character and expenses that may and must be considerable; and unless we make very extraordinary, zealous, determined, and persevering exertions, the institution must die in the nutshell, before it can germinate and take root: in fine, that unless we be faithful and honorable to each

other, and zealous for the interests of science; liberally devote much time, much industry, much labor, much attention, and any sum of money that may be requisite, such an establishment as the one we desire may never take place, or not for ages, in this community; a society of generous, good-willing emulation for the acquirement, increase, simplification, and diffusion of natural knowledge." Noble words these; and well meriting to be preserved, as they have been, for posterity! Noble they must have seemed to us, though the generous purpose of the men who uttered them had never been realized. With what reverence will they be read by the men of future time, who shall behold the consummation of the great work which these words inaugurated!

The limitation of our time will not permit us to follow, in detail, the series of self-denying efforts by which our founders advanced in the execution of their design. It would, perhaps, be impossible for us to form an adequate conception of their circumstances, so different were they from those which it is our better fortune to have reached. In every large city we witness cabinets and libraries, for promoting the cultivation of natural science. Learned professors instruct the pupils of our public schools; voluntary associations encourage and aid the rising na-

turalist; there is already a system of means by which the desire of knowledge in this department is quickened and supplied. In the year 1812, the student had few auxiliaries, and these were of narrow extent, as well as difficult of access. The general stimulus of public opinion and sympathy was deficient. Many avenues to wealth and fame, now opened by the application of natural science to the direction of national industry, were not available; and certainly the motives to explore them were comparatively insignificant. The simplification of the earth's history, which has been effected through the combined labors of the learned of every leading country, had not yet been accomplished. The manuals of elementary instruction which now smooth the first approaches of science, did not exist. In these, as in so many other particulars, a revolution has been effected in the United States, greatly multiplying both the motives and the instruments of scientific labor; and our retrospect would be not merely incomplete, but unjust to the little band of our founders, were we to disregard this fact.

In the beginning of the month of April, 1812, in a small room, rented on the second floor of a house on the east side of Second Street, near Race, was placed the

nucleus of the Library and of the Museum of the Academy. Some books, presented by Mr. Speakman and Dr. Mann; an herbarium, collected by Mr. Parmentier in the environs of Paris; a few shells and insects, the gift of Dr. Barnes; a few mounted birds from Mr. Say; and some artificial crystals, prepared by Dr. Troost, constituted the "collections" of the institution. The number of members was eight, of whom seven were officers of the Society; and we are told that, on the 18th of April, the Board of Managers having retired to an adjoining apartment to transact business, one gentleman was left alone to constitute the meeting of the Academy! Before the close of the year, the collections were removed to the upper part of a three-storied house on the west side of Second Street, the ground floor of which was occupied as a store for the sale of iron. This establishment was dignified by the title of the "Hall of the Academy of Natural Sciences." Several removals were subsequently made, viz., to Gilliam's Court, Arch Street, between Front and Second Streets, in 1815; to the southeast corner of Twelfth and George Streets, in 1826; and to the present location at the corner of Broad and George Streets, in 1840.

As early as the years 1814 and 1815, public lectures

on botany were delivered by two of the members. In 1817, the Academy was incorporated, and it began the publication of a Journal. It is gratifying to notice that in the list of names of the first publication committee, we read that of Mr. Ord, now the venerable President of the Academy. The members, "knowing," as they said, "how desirable it is that persons engaged in similar pursuits should be made acquainted, as early as possible, with what has been done by their fellow-laborers in the fields of science elsewhere, they mean to publish a few pages whenever it appears to them that materials worthy of publication have been put into their possession." . . . "They mean their proposed publication to be as cheap and as unostentatious as the nature of the subjects will admit." . . . "In short, they are desirous of contributing their share to the mass of knowledge as early in all cases, and with as little show, and as small expense as possible." By means of this Journal, a course of exchange was begun with the American Philosophical Society, and subsequently with other learned societies.

The collections of the Academy steadily increased, so that when the removal took place to the building at the corner of Twelfth and George Streets, the museum had

become an object of general interest; and it was opened to the public in the year 1828. Few of you can know what patient, persevering, minute industry is necessary to the formation and preservation of a cabinet of natural history. Not only must there be given a vast amount of time, personal exertion and exposure, and money, towards obtaining mineral, botanical, and geological specimens; but these require to be cleaned, dried, stuffed and mounted, or bottled, or otherwise prepared; they must be studied and classified, if before known; or, if new to men of science, they must be described, and a place assigned to them. The cleaning of skeletons, the setting of insects, the arrangement of plants, the developing of fossil forms, and a multitude of other offices are of daily requirement. You will presently see to how many myriads of individual examples these offices have been already applied; and perhaps you may in a small measure appreciate the devotion of those faithful students who during these forty years have been employed in the service of "natural knowledge." You may at least observe that they have indeed been, as at the outset they promised to be, "faithful and honorable to each other, and zealous for the interests of science." In this connection, permit me to repeat an

anecdote which must be familiar to many of you, which curiously illustrates the devotion of one of those members to whom the Academy is most indebted; one whose name will always be mentioned with special honor by the historian of the natural sciences, Mr. Thomas Say. This gentleman was a partner in business with Mr. Speakman, and by a reverse in their affairs, Mr. Say found himself involved beyond his means of payment. He gave up to his creditors all of his possessions, even the contents of his pocket-book, and the loose change in his purse. He then took lodging in the Hall of the Academy, where he made his bed under a skeleton of a horse, and fed himself upon bread and milk; occasionally he varied his fare by boiling an egg or cooking a chop. He regarded eating as an inconvenient interruption to scientific pursuits; and, he is said to have often expressed a wish that he had been made with a hole in his side, in which he might deposit from time to time the quantity of food required for his nourishment. His food during several years did not cost more than an average of twelve cents per day. Another gentleman, who has contributed largely to the scientific resources of the Academy, told the speaker not long since, that during a considerable period, while pursuing

studies, the fruits of which have been devoted to the institution, his expenses did not exceed ninety-nine cents per week. These may be extreme cases; but the spirit which they exemplify is daily animating numbers, of whose sacrifices the world at large takes no note. In the midst of their struggles for an honorable livelihood, they are found to nourish themselves only for the service of science. Uncheered by general observation and sympathy; shut out from the social enjoyments, without which most of you would regard life as gloomy; unsupported by the hope of emolument and future ease, they bring their daily offering to the common stock, rejoicing if this be found worthy of acceptance among their brethren; and well contented if their names be remembered among the disciples of learning, who shall live after them.

It cannot but gratify you to know that these patient contributions have already given to the cabinet of the Academy a very high rank. Imperial and royal patronage; the resources of national treasuries; the various influences flowing from ancient seats of learning; the freights of navies sailing to and from every quarter of the globe; public pride and private liberality; conquest and peaceful exchanges, have all combined to endow, to

foster, to make famous, the scientific cabinets of Europe. Yet, with the exception of the collections of the British Museum, of the Jardin des Plantes at Paris, of Berlin, and of Leyden, our Academy is unsurpassed in the world. In some departments, it is without any superior. The handful of books presented by Messrs. Speakman and Mann have grown into a library of nearly 17,000 volumes, many of them of the most costly kind, and all of them fitted to promote the studies of the naturalist. The little herbarium of Mr. Parmentier, has swelled into a collection representing more than 40,000 species of plants. The few shells and insects of Dr. Barnes have become a multitude, numbering more than 30,000. For the petty group of mounted birds of Mr. Say, we have now more than 25,000 specimens, forming the largest and best collection existing. As a successor to the artificial crystals given by Dr. Troost, we have a cabinet of minerals which with the geological specimens, now amount to nearly 30,000. Altogether the museum contains an aggregate of 150,000 specimens of natural history! This museum, you will bear in mind, is not a mere collection. Through the publications of the Academy, now amounting to many volumes, with illustrative plates, the naturalists

of the world have been seasonably informed of all the novel types of animal and vegetable life which have been discriminated by the members. It maintains friendly exchanges with the most distinguished academies of London, Paris, Amsterdam, Madrid, St. Petersburg, Moscow, Turin, Copenhagen, Münich, Brussels, Geneva, Lyons, and other cities of the old world. In the list of its correspondents you may see such names as Owen, Liebig, Lepsius, Humboldt, Arago, Lyell, Farraday, Müller, Ehrenberg, and Agassiz. It has assisted the counsels of government in the formation of plans for exploration; and in the roll of its active members you will find most of those learned adventurers who, whether by land or sea, have been the agents of the Republic in opening new domains to science, and in giving to our national reputation the lustre of successful scientific research.

Perhaps, by the consideration of results of such magnitude, secured after an interval so short since the foundation of the Academy, the thought may be suggested that there must have been employed a great multitude of collaborators; and your curiosity may be excited to learn how such an army of workmen could have been engaged so steadily, so earnestly, without attracting

more of your attention. Listen to the truth. Of all the population of Philadelphia during these forty-two years, the total number of persons who have become members of the Academy, whether active or inactive, is only about five hundred! During this period, it is regarded a liberal estimate to compute the contributors from all parts of the world, and of donations of every kind, as not exceeding one thousand in the whole!

Such, fellow-citizens, the beginning, such the career, such the achievement, of the institution which on this night first invites your public approval and sympathy.

II. It may seem to you that, in this age, and amongst a people to the mass of whom, more than to any other, the practical benefits of science have been made known, it must be superfluous to inquire the UTILITY of such institutions as the Academy of Natural Sciences. Perhaps the very success which has been described to you, and the fellowship of so many of the best informed men of the day, should be taken as conclusive evidence that some more solid basis than that of idle or whimsical curiosity has sustained our association. You may think that it ought to be assumed without question, that the near relationship of philosophy to the arts of life is suf-

ficiently established in our convictions to enable us to dispense with any formal demonstration of its existence or of its value. Yet, while we concede the important bearing of scientific investigations towards the development of social interests, it may nevertheless be true that we fail habitually to appreciate as we ought those details of research, those separate steps of prosecution, upon the series of which we are dependent for the final result. When we witness a practical advantage gained by our community, and are informed that it is due to a specified process, we are ready enough to perceive the connection of means and ends, and to applaud the sagacity, the patience, the perseverance, of the man who has conceived and executed the process; but are we as quick to judge and to feel favorably towards such a man before we are assured by actual experiment of the effect of his efforts? In short, are we prepared to estimate, even with a respectful and friendly spirit, that abstract devotion to science which is at once the great stimulator and consoler of its disciples? Suppose, for the sake of illustration, that a man of business—one, the chief occupation of whose life is pecuniary gain through the active traffic of our marts—visits the Hall of the Academy: what does he see? Along portions of

the walls are ranged cases, in which a multitude of skeletons, large and small, at first arouse him by their unaccustomed forms, and, after a little time, render him sad by their associations of mortality. His impressions become more unpleasant when his eye falls upon successive tiers of human skulls,—nearly a thousand heads, which were once living and intelligent as his own. He advances, and is for a short period relieved by the varied and brilliant plumage of birds of other climes; but these are motionless, and he soon wearies of the endless succession. The silence of the Hall is rendered more impressive by the reverberations of his occasional footfall. The stuffed and rigid forms of the mammalia seem to harmonize with the idea of death which everywhere prevails. Bats, reptiles, spiders, crowds of horrid things, seem to glare at him from lurking-places, or disgust him by their ugliness. He turns to the fossil cabinets, and admires some of the fanciful figures which are exhibited in the fragments of rock; but again the multitude and variety confound him; for, although the names are affixed, yet these convey no meaning to him. He scarcely recognizes the fact that he beholds the forms of once living things. When the feeling of novelty has a little subsided, and the most striking specimens, such

as a polar bear, a fossil elk, a wingless bird, a petrified fish, a mammoth's tooth, or the foot of a dinornis, have been examined, he looks around for the means by which to account for the zeal of the members who have given the best part of their lives to secure this collection. The bright sunlight finds its way through a distant window; he hears the cheerful sound of voices from the street, the quick tramp of the busy passenger, and the roll of vehicles. He thinks of the thousands who are engaged in commerce and in the mechanic arts; of the ships skimming the seas; of the railroad train, the telegraph, and all the great exchanges of the world. He looks again at the long rows of labelled stones, and spiders, and skulls, and snakes, and monkeys: and is it too much to say, my hearers, that he fails to sympathize fully with the men who, for the sake of collecting these things, have withdrawn themselves from pursuits which seem to him at the moment so much more worthy the warm-hearted energies of an adult, civilized man? If, at this moment, you were to approach him with a request to divert towards the enlargement of this collection a portion of funds which he had designed for the promotion of some project more nearly allied to his daily thoughts and occupations, would he not feel as though

you had asked of him to rob the commerce of the world only to enlarge an old curiosity shop?

Now, however exaggerated you may think this illustration, it needs little attention within your respective circles of observation to convince you that the relationship of the natural sciences to the progress of civilization is not so appreciated by the majority of our countrymen, or even by any large proportion of them, as that they are thereby rendered capable and willing to give to the cultivators of those sciences the same timely confidence and support which are bestowed upon other departments of industry. At every step, the question is asked, "Of what use is this?" and it is only when some triumphant result arouses society to hail the fortunate investigator as a benefactor to his race, or when the reaction of a foreign reputation gives a factitious value to him, that the popular voice is heard rewarding and encouraging his pursuits. Yet there is nothing in these so abstruse, nothing so difficult of comprehension by the mass of adult men, nothing so remote from the subjects of common thought, or so different from the materials or the methods of the ordinary kinds of labor, as to prevent an easy apprehension by every workman of the nature of his obligations to the natural sciences.

Nay more, it is quite safe to say that a large portion of the interest which fixes the attention and secures the continued exertions of the members of this Academy, may be imparted to the pupils of our public schools. The general assertion now made to you will be, to some extent, illustrated by the remarks that will be made upon the topic of UTILITY.

At the outset, then, what is it which most distinguishes the United States from other political or social organizations? It is not our attainments in agriculture, manufactures, commerce, or the fine arts; for in all of these we are excelled by Europeans. It is not our mere framework of government; for independently of the consideration that England is in every practical political sense a republic, it is to be remembered that, to use William Penn's phrase, "governments rather depend upon men, than men upon governments;" and a theoretical liberty may become a practical tyranny. Nor is it our maintenance of the doctrine that all men are equal; for, besides that this is physiologically false, we have it proved to us every day that, in a social and political sense, the doctrine is not reduced to practice. Our greatest distinction is to be found in the fact, that in our country, more than any other, whether in present

or former time, the education of the individual man is regarded—the development of every human being is a recognized primary duty. I say "more than any other country," because it is only in degree that we differ; and because we have many peculiar advantages, such as extensive territory, freedom from old restraints, and the like. Now you will concede that this common development of the mass of the people is not to be accomplished by making them good laborers, good artisans, good tradesmen. The most perfect workman is he who has been always employed upon one minute piece of manufacture; but he is little better than a lifeless machine. To educate the understanding, the sentiments;—to teach self-respect, which always grows in proportion to the elevation of habitual thought, and the refinement of ordinary feeling;—to enlarge the conception of the true place and office of man in the universe;—to promote happiness by multiplying the sources of innocent recreation;—and, above all, to exalt the notions commonly entertained of the moral Governor of the world, and of the motives to conform to the system of administration announced by him—these are the chief means by which, if at all, our excellence as a nation is to be demonstrated. With this truth in view, compare the condi-

tion of the modern man of labor with that of his predecessors; nay, compare it with that of the philosophers and poets and kings of the ancient world. Lay before you a map of the earth, as it appeared to Herodotus, or Pausanias, or Strabo; employ your imagination in forming pictures of it such as were sketched by Homer, or by Virgil; people it as its inhabitants were described by Aristotle, or by Pliny; let it be encompassed by such celestial machinery as was contrived by any or all of the astronomers, from Hipparchus to Ptolemy; then gather in council the gods and goddesses, with that most dignified of the ancient divinities, the JUPITER OPTIMUS MAXIMUS, in the chair of supremacy; and when this system of the universe has become familiar to you, invite one of the pupils of your High School to give you his notions of the creation, and those which, through it, he forms of the Being who could make and govern it,—and how will your estimate rise of every instrument, however humble, which has contributed to exalt, to enlarge, to purify the thoughts and feelings of man! How will the very boy grow in stature before you, until, compared with him, the wisest men of the ancient time seem like pigmies in the presence of an angelic nature! This, this will satisfy you what it is to read the book of

the world; and in what manner it is that the investigations of men of science come at last to be the property of the men whose daily bread is purchased by daily physical labor.

It is one of those benevolent and skilful arrangements of which so many examples are discernible, having for their object the education of our race, that facts which cost the slow research of successive generations, and to the ascertainment of which many abstruse mental processes and many nice improvements in the arts are necessary, may be comprehended through the aid of a simple statement or description, such as is suited to the average popular intelligence. Like the long-forgotten monumental histories of the Nile, or the Euphrates, the narrative, to decipher which required the best learning of the world, may be easily taught in the books designed for the use of children. The rotundity and dimensions of the earth, its proportions of land and water, its picturesque varieties of surface, the distribution of plants and animals upon it, its atmospherical phenomena, its place in the system of which our sun is the centre, the place of this system among the millions which revolve in the unfathomed immensity, in short, all the grandeur, the glory, the infinite multitude of the universe

as far as this has been explored by the most successful observer, can be made the framework of thought and hope and joy to him who follows the plough, or who trims the sails of commerce. Already the rustic of our frontier is in these respects a more learned man than Warwick the "King-maker." Alexander, the conqueror of nations, the pupil of Aristotle, knew less of the starry heavens than many a mechanic's apprentice of modern Philadelphia. This information, you will readily perceive, is much more than a mere accumulation of curious facts; it furnishes the materials by which every man builds up his notion of the world in which he dwells; of his own significance amongst the tribes of beings which surround him; and of the degree of power and wisdom and majesty of the Artificer of the globe. Let a few illustrations, from the host which are available, suffice for this topic. What a stride must the understandings of mankind in general have made, when the lightning—once the chief terror of the king of the gods—is parried by a wire projecting from the peasant's roof; and is even made to play the part of postboy for a pittance such as a laborer may earn in a few hours! What becomes of the superstition of antiquity when the right to control this once dreadful messenger of

heaven, is made the subject of litigation at the patent-office! Again, how different the idea of the earth's history, and of his own function, entertained by the artisan who sees in the coal at his forge a portion of the carbon of a forest which grew and died and was buried long ages before there was a man upon the earth; who recognizes in it one of the proofs of a vast series of epochs, full of demonstrations of the creative power and wisdom and goodness; from the conception which in other days represented the whole earth as a rude mass of matter, of which all the history could be told in the words "it was, and is!"

With reference, then, to the elevation of the intellect of our people, the refinement of their sentiments, the augmentation of their personal dignity, the rational and agreeable occupation of their leisure hours, their protection from superstition, and the exaltation of their ideas of the grand exemplar of intelligent and moral natures, we might have sufficient reasons, were there no others, to urge the cultivation of the natural sciences as useful to all classes; and the force of these motives can lose nothing in your minds by the fact (which we all gladly recognize), that the proper relationship of labor to the respect of men is beginning to be acknowledged. It

can never be completely established in the sight of the wise, the good, the gentle, until rude features shall have been softened, and fierce impulses regulated by the standards of a true civilization; until the estimate which the laborer habitually forms of himself be rendered equal to the position which is theoretically claimed for him.

Leaving the consideration of this general influence upon the character of our people, let us recall a few of the instances by which the advantages of the natural sciences are most easily exemplified in connection with those interests which engage the attention of the bulk of our nation. First amongst these, both in regard to the number of those who are occupied by it, and its primary relation to all other forms of industry, is agriculture; that is, the production of vegetable forms in places, or in varieties, or in quantities, in which they would not grow and mature without artificial aid. This requires a soil, that is to say, materials out of which plants are to be manufactured by natural chemistry; and since each species of growth requires different materials or different proportions of them, and since, also, the surface of the earth is not of uniform composition, but is made up of numerous widely differing patches, it is obviously im-

portant for us to know which of the constituents of our crops are present, and in what proportions; and which of them are absent, and are therefore to be added by our own hands. Our race spreads slowly over the globe, so that there have always been heretofore, and there are now, wide districts, of the mineral character of which mankind could have no information except through the special observation of experienced persons. Even in those places where a long course of merely traditional husbandry has been practised, the most productive management of the natural and the artificial materials has not been generally attained. Now it must occur to every one as a highly desirable thing, by a few months' employment of a small company of men, to obtain a particular report of thousands of square miles of country, remote from actual settlements, covered it may be with tangled forests, and inaccessible without great risk and sacrifices to those who are to occupy it and make it fertile—territories such as those which we have called Wisconsin, Iowa, Nebraska, Oregon. This must seem still more important, when you find that such a report, upon being compared with what was before known of cultivated districts, enables us, even in the closet, to frame an outline plan, not only of settlement, but of

husbandry. The volumes which contain this kind of information are large and numerous; and their contents, like all other materials for instruction in our day, are rendered popular, and are diffused by the press, by private teaching, and by example, throughout the community.

Look to the mineral treasures of the earth, and in order to represent to yourselves the difficulties which impede unlearned explorers, endeavor to determine where they should dig for coal, where for iron, or any other metal; and consider what waste there must be of time, and money, and labor, and how social progress must be retarded, before what we have witnessed could be accomplished by them. Yet when it is ascertained that the rocks composing the earth's crust exist in a fixed relative position; that they have respectively well defined limits, and that the coal, and the iron, and other sources of artificial wealth are found only in connection with particular groups or bodies of rock; and when these groups are mapped for us, so that we know the mineral character of each district, then it is clear how special explorations are guided, and how not merely their economy, but often their success, is dependent upon the generalizations of science.

But your surplus agricultural produce, and the manu-

factures wrought from these, and from minerals, must find a way to the markets whence they are to be distributed amongst consumers. They must be floated down streams, or carried over wagon-roads or railroads; and as the surface of the earth is very uneven, being broken into mountains, ravines, valleys, and plains, it is essential to know by what routes we shall avoid obstructions, and obtain the cheapest transportation. This in turn requires that we learn the topography of the country over which we are to pass; and if canals and roads are to be constructed, that we be able to determine without excessive expenditure, the comparative facilities for excavation and embankment; and these are manifestly as dependent as our agriculture and our mining, upon the mapping of rocks according to their locality and mineral character.

If we consider how many subdivisions of inquiry, chemical, botanical, mineralogical, are demanded for the qualification of our pioneers of industry, with reference to the departments which have been named to you, and what a multitude of particulars of knowledge must have become familiar, before a student could be a reliable describer of the agriculture, mineralogy, and general topography of any large area, we must be convinced

that very serious training must precede great usefulness in such a connection. It is to be further noticed that a large proportion of the stratifications of rock by means of which the practical results under review are secured, are discriminated at every experiment, or at least originally, mainly by means of the fossil remains of animals or vegetables which they contain. The state of things in which we live being the last of a prolonged succession of eras, during each of which there existed forms of organized beings peculiar to it, most of which have become extinct, it is necessary for the observer to become acquainted with fossil zoology and botany. It is fortunate for his success that there has been maintained, through all of those eras, an analogy of organization which renders his studies of existing animals and plants available for the classification of the extinct ones. But he must adjust the criteria of genera and species; and to do this he must make himself familiar with living types; for which, as he cannot roam the world in search of all of them, he must be indebted to the assistance of many contributors. Thus we see in brief how GEOLOGY is made the handmaid of the arts which minister to our wealth and comfort; and the inference is too obvious for any explanation, that

this one, at least, of the objects of the Academy, is commended by its utility.

Where shall we stop in such a course of illustration? The natural history of the earth comprehends all those things, animate and inanimate, and all those powers at work amongst them, which constitute or control what is perceivable by us upon its surface. Follow these, then, through all the ramifications of usefulness to which they have been conducted by human skill; contemplate man as a naked savage, and then behold him in the midst of the products of civilized art; and there will arise no doubt that any institution which promotes the discovery or the communication of such knowledge as could produce such a contrast must merit the common support. What—to pause upon a single example—what makes the COMMERCE of our country? Take into your hands a Congressional document exhibiting the imports into the United States, and the exports from them; examine its catalogue of mineral, of vegetable, and of animal substances which are exchanged amongst the different nations; inquire how these substances were discovered, or by what causes they have reached the altered condition in which they are transported; and you will find that most of them have become articles of traffic because

men of science, the students of the earth's natural history, have found them, tried their properties, and converted them, by the aid of the handicraft of our artisans, into the means of social ease and refinement, and of national enrichment. By many generations, these accumulations of knowledge and these employments of skilful labor have been multiplied; and now the bills of lading of our merchants present to us results of natural science practically applied during thousands of years. Think you that, with such views of the utility of the investigations which have occupied the members of the Academy, the man of traffic, whom we have imagined as shrinking from the gloom of its Hall, and as condemning the apparent want of practical influences flowing from it, would again fail to apprehend the links which bind even the daily routine of his daybook and ledger to the secluded studies of that collection of stones and skeletons? "See," might we say to him, "see how the orderly arrangements of Nature are illustrated by these stones; how they represent the stratifications of the earth's crust; how these fossil shells and fishes and plants exemplify the series of rocky formations upon which you depend for your various soils, your coal, and iron, and copper. See how these bony frames typify

classifications by which those formations are identified, and by which also the historian of living tribes recognizes their relationships. See these specimens of vegetables by which the arts are enriched, and to which you owe gains drawn from commerce with men whose resources neither you nor they would have known without the aid of the volunteers of science. This is the school in which are educated those upon whom you depend for the security of many of your investments. A speculation in copper lands of Lake Superior; in coal lands on Broad Top, or in the Cumberland region, or the anthracite basins; in the lead lands of Illinois, or the iron beds of Pennsylvania, is rendered prudent only because you, sagacious man as you are, have obtained the opinion of those whose studies in this Hall had aided to complete their qualification for giving judgment. It is with such auxiliaries as these before you that the men who sign reports of railroad routes, or the instructors of such persons, have become able to speak so as to secure your confidence, so that you freely and hopefully give the earnings of your lifetime, and the fortune of your family, to build such roads for hundreds of miles through a wilderness."

It would add much, my hearers, to the impression

made upon yourselves at this moment by the topic before us, if there could be exhibited to you a list of those persons in the United States who have been distinguished for their attainments in natural science, and whose preparatory studies were wholly or in part made with the aid of the collections and library of the Academy; and if you could witness a few examples of the manner in which it becomes a centre of reference for those whose publications are to enlighten the people and their legislatures upon the material resources of the public. Among the illustrious dead, you would find the familiar names of Godman, and Harlan, and Morton,—that revered and beloved disciple of learning, so lately snatched from us in the midst of usefulness and honor. The roll of the living is too long for even a naked recital upon this occasion; and it might seem invidious to discriminate amongst these, though only for such a purpose as the present. Yet there is one whom, under the hospitality of this roof, it may be a duty to mention; one who, though young in years, has already secured a European as well as an American reputation, and the promise of whose career thus far as a comparative anatomist is honorable not only to the Academy which has encouraged and facilitated his labors, but to

his country; the gentleman who, through the wise choice of the Trustees of this University, now fills its chair of Anatomy,—Dr. Joseph Leidy.

Your speaker feels much embarrassed by the necessity of confining to so small a number of instances, his illustrations of the usefulness of such an institution as the Academy of Natural Sciences. Yet to an intelligent audience, perhaps, the chief design of those illustrations may be secured by a few examples. You are prepared to concede, that an influence is exercised by every department of knowledge upon every other department—to recognize that (applying the words of Cicero) all have a common bond, and are connected by a certain family relationship; and hence, that progress in one insures progress in others, and that it is from the combination of the whole that the complex advantages of civilization are obtained. It may not, indeed, be possible to show to you at every step an immediate practical effect. "How many substances are analyzed by the chemist," says an English metaphysical writer, "which can never be rendered useful?—how many plants are minutely described by the naturalist, which might have remained in obscurity without detriment to the world? —how many events are narrated by the historian, from

which no beneficial inference can be drawn? It seems to be a necessary condition of human science, that we should learn many useless things in order to become acquainted with those which are of service; and as it is impossible, antecedently, to experience, to know the value of our acquisitions, the only way in which mankind can secure all the advantages of knowledge is to prosecute their inquiries in every possible direction. There can be no greater impediment to the progress of science, than a perpetual and anxious reference at every step to palpable utility."

Our limit of time will not allow us to exemplify this quotation, by instances from the several departments of natural history; but there has been published in the newspapers, within the last few days, a novel result, so curious that it ought not to be omitted.

If, a month ago, we had seen a man inspect, through a microscope, some *mud*, and discover in it the forms of minute animals, we should probably have been unable to trace any connection between that discovery and a proof of the feasibility of a communication with England by the magnetic telegraph. Yet see what has been done with such a fact by a man of science. That mud came from the bottom of the Atlantic Ocean, be-

tween Nova Scotia and Ireland; and the animal forms having been found to be complete, they could not have been subjected to any cause which could crush or much abrade them. But a strong current flowing at the bottom of the ocean would have destroyed the integrity of things so fragile; it is therefore evident that no such current flows in that part of the sea, and hence there is none to disturb the telegraphic wires. Thus has a most important doubt been solved through the vigilance and sagacity of Lieut. Maury, of the National Observatory, to whom the microscopic discovery was communicated without reference to that doubt.

"How many useful inventions," remarks Malthus, the political economist, "and how much valuable and improving knowledge would have been lost, if a rational curiosity, and a mere love of information had not generally been allowed to be a sufficient motive for the search after truth?" Will you not go further, and sympathize with that humiliation which Sir John Herschell truly says is felt by the philosopher "who loves knowledge for its own sake, and enjoys, as a rational being should enjoy, the mere contemplation of harmonious and mutually dependent truths," when he is restricted to the justification of himself by some paltry question

of external advantage? Will you not also sympathize with that "lofty and disinterested pleasure" of which he speaks, as exempting the student from sordid questioning, because it "communicates to his own mind the purest happiness (after the exercise of the benevolent and moral feelings) of which human nature is susceptible?" Will you not respond so far to the attestation of another votary of science, Prof. Nichol, as to appreciate "that profound and solemn pleasure which," he declares, "men of right temper must ever feel, when it is their privilege to commune with hearts beating in unison concerning the greatness and glory of this wonderful universe?"

III. What remains? You know the history of the Academy, you know the character of its usefulness; have you not already spontaneously sought also to recall the means by which you, too, may share the honor, the merit of such sacrifices, such promotion of the welfare and dignity of your race? Do you not desire to become participators in some way with those who are hereafter to strengthen and to enlarge the resources of such an institution, and to apply them to the general good? As men, you have the common interest of the species in

whatever can augment and vary the instruments of civilization; but have you not, in addition, a zeal to employ, in such a cause, the peculiar opportunities which are opened by the fortune which placed the Academy in your midst? Can you doubt for a moment where any of these opportunities are to be found? You have seen how some poor naturalists have deprived themselves even of the simple meal which refreshes the laborer's family, in order that the triumphs of knowledge might be secured;—how the enticements of lucrative professional distinction, and the pleasures of social festivity have been renounced, in order that science might flourish;—how, amongst all the burdens and temptations of life, there have been given time and toil and money to the erection of this temple of useful learning, and the completion of its service. Surrounded by luxuries, secure in the enjoyments of home, or engaged in the cheerful commerce of society, have you no offering to make to the treasury of this temple? Will you leave to those who have dedicated their all to its establishment, even the daily cost of its preservation for your benefit?

You have children, who may be taught the value and the dignity of its relationships to human progress; in

whose minds may be kindled that love of science which shall render them its worthy pupils; and which shall hereafter make of them diligent missionaries to instruct and to elevate their countrymen, as well as abundant contributors to the resources of learning. You may aid the foundation of agricultural schools, in which the application of geology and botany, and chemistry and zoology, shall be taught to the cultivators of the soil. You may establish a school of mines, in which the processes by which the mineral treasures of the earth are most productively sought and converted into useful forms, and transported throughout the world, may be communicated, so as greatly to promote the economy and rapidity of the distribution of the results amongst the mass of mankind. These, and many other modes of material assistance, are daily within your reach, and they offer to you a daily duty, together with the most substantial motives for its performance.

Consider how your obligations are strengthened by circumstances peculiar to the age in which you live, or to your own country. The vast and still growing extension of our language in both hemispheres—the great diversity of the natural objects within the range of which the people speaking that language are distributed

—the physical peculiarities of our own hemisphere, and its animal and vegetable inhabitants; and the influence of these upon the European systems of natural history—the larger generalizations which have been rendered possible and safe by the regular development of the inductive method, and which widen the field of application for natural laws—the ease and promptness with which the results of the scientific research of the whole world are diffused amongst our countrymen—the unprecedented cultivation of the industrial arts amongst and for the masses of mankind—the general recognition of the value of empirical discoveries in art as bases of scientific experiment, and of the value of scientific conclusions as guides of art; forming a combination of theoretical and practical experience never before known—the inventive genius of our people—the activity stimulated and protected by our political and social institutions—the greater cheapness of materials used in inventions and in the arts which render them productive to the community—the ready application of capital to industrial enterprises, giving to them a patronage never equalled in former times; such, with all their reciprocal effects, are some of the encouragements which invite your cheerful and persevering support to our Academy.

There is a delicate mode in which your friendliness towards it may be exhibited; one which is dependent upon your maintenance of proper sympathy with the men who, in its retirement, labor so earnestly in your behalf. Let them ever be assured that you appreciate what they are doing and suffering; that you do not regard them as persons whose trade (to quote the author of the Wealth of Nations), is "to do nothing, and to speculate upon everything;" nor as persons who are destitute of the kindly susceptibilities of humanity, and who are to be contemplated as you gaze upon the bloodless specimens in their collection; but rather as useful, warm-hearted, self-sacrificing contributors to the common good, whose hours of solitary study may be cheered by the knowledge that their contemporaries, their compatriots, their fellow-townsmen, recognize their services, and greet them with respect and kindness.

It may seem strange to you that, in conclusion, there should be addressed to you an exhortation to avoid the persecution of these men. The days of fire and fagot have indeed passed away; the right of opinion and the freedom of the press are sanctioned by public charters as well as by private concession; a liberal spirit of in-

vestigation has been encouraged; and in this republic, at least, you may be ready to reply, no one can be persecuted for an honest opinion upon a question of natural science. Yet, my hearers, the roll of the martyrs of science was not ended with those who suffered by the dungeon or the stake; there are other modes than these of torturing the unfortunate discoverer of truths which are unpalatable to a community—other modes of vindicating popular prejudice. It is possible to render life unhappy by cutting off our victim from social intercourse, by tarnishing his reputation, by invading the sacred circle of his friendships and rendering him practically an outcast from the sympathies of his fellow-men. Discreditable as it is to the enlightened age in which we live, true it is, nevertheless, that one of the most sublime discoveries ever made by human minds, viz., that of the fossil evidence of the antiquity of the series of living beings; of the stages by which the surface of this earth was prepared for the residence of our own race, would, even at so recent a period as the boyhood of your speaker, have been sufficient to insure in the public mind of the United States the designation of an infidel, an enemy of religion, to any individual bold

enough to proclaim his belief in the facts ascertained by geologists. The astronomical discoveries which once put in jeopardy the fame of Copernicus and Galileo were not more repugnant to popular belief than the generalizations of the geological observer; nor more denounced as hostile to the interests of religion. Truths which are now not only conceded by all well educated men, but, in large cities, openly assumed in the pulpit, were then generally, and are still in some localities, treated as malignant inventions of minds hostile to any system of direct revelation; and even in large cities it is not difficult to find persons who so adhere to the traditions of an uninformed past, as to shun the social fellowship of all who yield to incontrovertible proofs which have compelled the assent of the most enlightened leaders of the Church. In the lifetime of many who honor me with their attention, the attempt to assign a greater duration to the chronology of Egyptian history than had been accepted by the multitude, was met with a shout of execration throughout Europe; and yet, here in your own public libraries, there are now collected carefully and at great cost, and exposed to the popular eye, the works of such explorers as Lepsius and Rossel-

lini, which render certain the very antiquity the assertion of which was so lately regarded as conclusive proof of enmity to God and man. Think not that the bitterness of polemics has been neutralized by the charities of domestic and social relationship, even in our own circles of intercourse. It is hazarding nothing to say that an important novelty in science, however clearly and firmly attested, might be received as unwillingly and contested as hotly, and might make as wide breaches of social connections, as could be asserted of the modern systems of astronomy and geology at the time of their first promulgation.

Have we not, Mr. President, fresh in our remembrance the example of our late friend and chief?—one who lived in this community as an ornament of it, richly endowed as he was with virtues;—one whose name is honored wherever natural science has a worthy disciple;—one who sought truth, as in obedience to a divine injunction, and who, in his high office of "minister and interpreter of Nature," performed his sacred function in all sincerity and humility of heart. After years of faithful study had enabled him to discern footprints of events over which the waves of Time had so long

washed as to have buried them from the eye of the common observer, he announced, with all the modesty which distinguished him, his cautious deductions, in order that their value might be tested by the learned throughout the world; and he was immediately assailed with a virulence which even crime could scarcely have justified. It is over the newly-made grave of MORTON that Science once more appeals to mankind to cease from outraging the name of Religion by persecutions of those who honestly seek to read aright the works of the Master of Life! What to MORTON were the triumphs of a false philosophy? Let the answer be made in his own words, hallowed now to our memory.

"What art thou, world! with thy beguiling dreams,
Thy banquets and carousals, pomp and pride?
What is thy gayest moment, when it teems
With pleasures won, or prospects yet untried?

"What are thy honors, titles, and renown,
Thy brightest pageant, and thy noblest sway?
Alas! like flowers beneath the tempest's frown,
They bloom at morn—at eve, they fade away!

"A few short years revolve, and then—no more
Can Memory rouse them from their resting-place;

The joys we courted, and the hopes we bore,
Have passed like shadows from our fond embrace.

"But is there nought, amid the fearful doom,
That can outlast the wreck of mortal things?—
There is a spirit, that does not consume,
But mounts o'er ruin with triumphant wings.

"And thou, Religion! like a guardian star,
Dost glitter in the firmament, on high,
And lead'st us still, though we have wandered far,
To hopes that cheer, and joys that never die!"

So thought, so felt, that disciple of science, of whom, to the lasting dishonor of the scientific literature of our country, it has been recently published, that, for the vain distinction of a brilliant falsehood, he made himself an enemy of the faith and hope of the Christian for this world and for eternity! What say YOU, citizens, you who knew, and trusted, and loved him?

It may be that when the student, at the close of a research protracted through a long period of doubt, and toil, and privation, sees suddenly the realization of some shadowy prophecy which had haunted his brain; and a problem which had mocked the best efforts of his pre-

decessors, at once receives its solution; and the future is filled with visions of good to his race,—it may be then, that, inspired by success, he overleaps too fiercely the barriers of prudent reserve, and in the ardor of the moment announces, without due preparation, the truth which is to overthrow ancient convictions, or to effect a revolution in the practical interests of his contemporaries. It is possible, too, that when, instead of the sympathy, perhaps the public acclamation, expected by him, he encounters the full tide of an envenomed opposition, he may experience a reaction injurious to his moral nature. If the sanctions of religion are directed against his announcements, and he is placed under a ban which marks him as a person leprous in the sight of his fellows, it may even happen, as we are admonished by that learned philosopher and theologian, St. Augustine, that, from a confounding of dogmatic error with the true faith, the latter shall be cast aside, leaving only the system of unspiritualized matter for a basis of opinion. On the other hand, may it not also happen, that those who are the guides and instructors of the people, in the written and oral traditions of a divine revelation, may be too indifferent, or too "sceptical," in relation to the evi-

dence afforded by the book of the CREATION? From the time when there was a party for Paul, and one for Apollos, and one for Cephas, down to the present day, history records an uninterrupted series of controversies upon the tenor and application of the divine manifestations of truth. Here, in Philadelphia, there are "divisions" and "contentions" among yourselves; and is it not at least a possible thing, judging by all experience of the development of natural science in its connections with moral and religious opinion, that again, as heretofore, we may be required to acknowledge our "infidelity" to the instruction written upon the pages of creation by the finger of the Creator? If, then, there should reach you a report of fresh discoveries in the starry sphere, or in the crust of our own globe—in any field, large or small, which is open to human exploration, be firm in charity as well as wisdom; believe with the enlightened Chalmers, that even though the literary evidence and the regularly deduced generalizations of physical science should be for a time in seeming contradiction, no truth can be extinguished; believe that, instead of your proper faith being undermined, you will in the end receive new and more impressive illustrations of the

greatness of God. What could have supplied to us the loss of the information which we now have, of the sublime grandeur of the universe?—information which might have been suppressed, if a bigoted championship of old interpretations could have succeeded in its assaults upon the honest array of scientific proofs. Oh, if the votary of science could ever be permitted to disturb the tranquillity of his meditations by scorn for the petty oppositions of ignorance and selfish arrogance, it would be when, from the reverential contemplation of those solemn mysteries of time, and space, and being, and causation, which are involved in the infinite world, he comes to announce some truth which has been revealed to him, some new hope of elevation for his race; and when those for whom he has interrogated nature, while *they* have been absorbed in the pursuits of avarice or of pleasure, return him malice and mockery for his disclosures, and proclaim his toils only as the extravagances of folly or of impiety!—But already the ordinary limit of an anniversary discourse has been exceeded; to your own sober and charitable reflection the topic must be committed.

You will carry from this Hall, it is hoped, a clearer

recollection of the history of our institution, and of its influences upon the general prosperity,—a warmer zeal for the execution of its plans,—and a resolution to extend a generous and enlightened sympathy towards its members. If again you should assemble with them to celebrate its foundation, may you and they have enjoyed many new proofs of the tendency of the natural sciences to promote the physical, intellectual, and moral good of mankind!