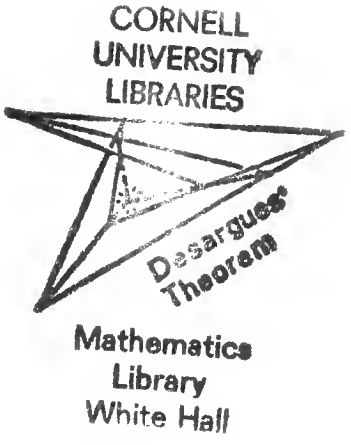

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ADDRESS

OF

PROFESSOR BENJAMIN PEIRCE,

PRESIDENT OF THE AMERICAN ASSOCIATION FOR THE YEAR 1853,

ON RETIRING FROM THE DUTIES OF PRESIDENT. .

[Printed by Order of the Association.]

MR. PRESIDENT AND GENTLEMEN OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE : —

In most offices, the duties terminate with the office, and the thing of the past, the ex-officer, is to the present an unknown quantity. But it is not so with your President. Science, with its time-annihilating power, which gives life to the fossil, which hurries the embryo future into premature birth, which ventures beyond the grave even to the foot of the invisible throne, sternly drags forward its reluctant presidents to their hardest trial when they have ceased to be, to a judgment after death severer than that of Rhadamanthus. This calling out of the actor upon the stage after the night of performance, when the blood is no longer warm, is all the worse to him who has never before made a set speech, all whose habits of thought are unknown to æsthetic display, and the Arctic latitudes of whose frigid studies are impenetrable to the God of eloquence and to the Muses who vibrate the silver-toned chords of human sympathy.

Geometry, to which I have devoted my life, is honored with the title of the Key of the Sciences; but it is the key of

an ever-open door, which refuses to be shut, and through which the whole world is crowding, to make free, in unrestrained license, with the precious treasures within, thoughtless both of lock and key, of the door itself, and even of science, to which it owes such boundless possessions, this New World included. The door is wide open, and all may enter; but all do not enter with equal thoughtlessness. There are a few who wonder, as they approach, at the exhaustless wealth, as the sacred shepherd wondered at the burning bush of Horeb, which was ever burning and never consumed. Casting their shoes from off their feet, and the world's iron-shod doubts from their understanding, these children of the faithful take their first step upon the holy ground with reverential awe, and advance almost with timidity, fearful, as the signs of Deity break upon them, lest they shall be brought face to face with the Almighty. They are the searchers after truth, and do not pass the door or the key without careful scrutiny.

The key! It is of wonderful construction, with its infinity of combination, and its unlimited capacity to fit every lock, however varied in form and size; it closes the massive arches which guard the vaults whence the mechanic arts supply the warehouses of commerce, and it opens the minute cabinet in which the queen of the fairies protects her microscopic jewels; it is the great master-key, which unlocks every door of knowledge, and without which no discovery — no discovery which deserves the name, which is law and not isolated fact — has been or ever can be made. Fascinated by its symmetry, the geometer may, at times, have been too exclusively engrossed with his science, forgetful of its applications; he may have exalted it into his idol, and worshipped it; he may have degraded it into his toy, and childishly amused himself with the singular shapes which it would assume, when he should have been hard at work with it, using it for the benefit of mankind and the glory of his Creator. I have seen a watchmaker, who came into possession of a remarkable chronometer, which was made by a prince of the craft, — by one who only made a single

chronometer in a year; but that single watch was a masterpiece of art, and in every part a model of exquisite workmanship. The single-hearted watchmaker would sit and gaze at the neat key of his chronometer by the hour together, wasting in admiration the precious time, which his faithful watch continued to measure. With the same simplicity of devotion, the mathematician, unable to resist her charms, may embrace his science too ardently, when it lies close to his heart; and thus her integrity may be suspected. But ascend with me above the dust, above the cloud, to the realms of the higher geometry, where the heavens are never obscured; where there is no impure vapor and no delusive or imperfect observation; where the new truths are already arisen, while they are yet dimly dawning upon the earth below; where the earth is a little planet; where the sun has dwindled to a star; where all the stars are lost in the Milky-Way to which they belong; where the Milky-Way is seen floating through space, like any other nebula; where the whole great girdle of the nebulæ has diminished to an atom, and has become as readily and completely submissive to the pen of the geometer, and the slave of his formula, as the single drop, which falls from the cloud, instinct with all the forces of the material world. Try with me the precision of measure with which the universe has been meted out; observe how exactly all the parts are fitted to the whole and to each other, and then declare who was present in the council-chamber when the Lord laid the foundations of the earth.

Begin with the heavens themselves; see how precisely the motions of the firmament have endured through the friction of the ages; observe the exactness of the revolutions of the stars; if these mighty orbs cannot resist the law, what can the atom do? Let, then, the resources of art be exhausted in this scrutiny. Let neither time nor labor nor money be spared. A slight defect of motion is just detected; it is slight, very slight, but it is unquestionable. We dare not hide it out of sight. Science must admit this triumph of art, and be true even if the stars are false. The names of fixed star

and pole-star must not be suffered to impose upon the trusting world, and guide it in a delusive chase after an *ignis fatuus*. Geometry! to the rescue! Geometry is at her post, faithful among the faithless. The pen is at work, the midnight oil consumed, the magic circles drawn by the wise men of the East, and the wizard logarithm summoned from the North. The tables are turned. The defect of motion is transformed into the discovery of a new law. It becomes the proof of the atmosphere to bend the ray from its course as it shoots down, laden with the image of Arcturus and the sweet influences of the Pleiades; it becomes the proof of the moving light, of the unseen planet, and of the invisible star, and hence a new proof of the precision of the measure. Honor to Bradley, to Bessel, to Adams, and to Leverrier! The stars are not false. Question them as you may, they give the same evidence, and do not contradict each other's testimony. They tell us that ours is not the central sun, and that we are moving in the procession of the stars; they tell us that we move among the others, towards the constellation of Hercules, so that, while we grow in wisdom, we approach the strong man's home. They tell us that we are moving at such a rate, that the distance from star to star is but just a good geological day's journey; and hereby they confirm the story which is written upon the crust of our globe, and prove that the earth and the skies have been measured out with the same unit of measure.

Descend from the infinite to the infinitesimal. Long before Bacon and Galileo, before observation had begun to penetrate the veil under which Nature has hidden her mysteries, the restless mind sought some principle of power, strong enough, and of sufficient variety, to collect and bind together all the parts of a world. This seemed to be found, where one might least expect it, in abstract number. Everywhere the exactest numerical proportion was seen to constitute the spiritual element of the highest beauty. It was the harmony of music, and the music of song; the fastidious eye of the Athenian required the delicately curved outlines of the temple

in which he worshipped his goddess to conform to the exact law of the hyperbola, and he traced the graceful features of her statue from the repulsive wrinkles of Arithmetic. Throughout nature, the omnipresent beautiful revealed an all-pervading language spoken to the human mind, and to man's highest capacity of comprehension. By whom was it spoken? Whether by the gods of the ocean and the land, by the ruling divinities of the sun, moon, and stars, or by the nymphs of the forest and the dryads of the fountain, it was one speech, and its written cipher was cabalistic. The cabala were those of number, and even if they transcended the gematric skill of the Rabbi and the hieroglyphical learning of the priest of Osiris, they were, distinctly and unmistakably, expressions of thought, uttered to mind by mind; they were the solutions of mathematical problems of extraordinary complexity. The bee of Hymettus solved its great problem of isoperimetry on the morning of creation; and the sword which threatened the life of Damocles vibrated the elliptic functions two thousand years before Legendre, Abel, and Jacobi had gained immortality by their discussion. The very spirits of the winds, when they were sent to carry the grateful harvest to the thirsting fields of Calabria, did not forget the geometry which they had studied in the caverns of Æolus, and of which the geologist is daily discovering their diagrams. When they traversed the forest, they vibrated the bending branches and the hanging vines into every variety of elastic and catenarian curve; as they passed over the city, they wreathed the rising smoke into spirals, at which the ancient philosopher could only gaze in admiration, as it ascended with double curvature in its lofty exponential path, and was lost to computation ere it vanished from sight; and even when, forgetting their beneficent mission, they raged, that awful night at sea, in a fearful struggle with gravitation for the dominion of the ocean, amidst the shrieks of the drowning sailor, they heaped up the waves into such majestic mountains, that the genius of the storm thundered his approbation,

and man's analysis shrunk from the investigation of the strange forms, not daring even to give them a name.

Ancient philosophy, perceiving this power of number, did homage to it in all the simplicity, earnestness, and truthfulness which distinguished the early thinkers. Pythagoras and Plato, the founders of pure mathematics, turned their search inward to find in their own minds the origin of that force, which a universe of phenomena could only reveal in its effects, but not in its essence. They found there a principle, capable of ruling, restraining, and satisfying the extravagant fancy, the ardent imagination, and the licentious will, and of reducing all the faculties to harmonious and consistent action. Its dignified exterior was cold and forbidding, and marked with the gloomy inflexibility of the representative of justice, rather than with the gracious supremacy of a sovereign. Boldly penetrating it, they were rewarded with visions of sublime contemplation, such as the world had never yet beheld; and the majestic glories which surround the throne of number, to those few who are permitted to behold them, took their hearts captive. In the intensity of their enthusiasm, they unconsciously overstepped the bounds of human knowledge, and strove to grope their way where the torch of observation was not yet lighted. They sought in the monad, the duad, and the triad, the mysteries of the Divine nature; in the perfect number, the archetype of the highest good; and in such simple numerical ratios as their unaided reason could devise, the complicated logic of all life. The school-boy of the nineteenth century can detect and ridicule their errors, but the lovers of truth will always revere their memories, and the great discoverers will never cease to find in their magnificent investigations the elements of further progress. Ay! more than this! Modern science has realized some of the most fanciful of the Pythagorean and Platonic doctrines, and thereby justified the divinity of their spiritual instincts. Is it not significant of the nature of the creative intellect, the simplicity of the great laws of force? the fact that the same curious series

of numbers is developed by the growing plant which assisted in marshalling the order of the planets? and that the marriage of the elements cannot be consummated except in strict accordance with the laws of definite proportion? This last extraordinary discovery has rescued chemistry for ever from the blighting thrall of superstition, and, elevating it to the rank of a science, has endowed it with the rudiments of a peculiar speech. The promise has just been given, by one of our own number, of a large extension of this fruitful law; Young America has given the pledge, and we have faith in her chivalry that she will redeem it; we may then hope that the atomic force will submit to some Newton of chemistry, and the formula of the crystal become as legible as that of the solar system. In all parts of the physical world, in sound and light, in electricity and magnetism, in the elements of the air and the ocean, the same precision is everywhere predominant. The tints of the morning cloud reflecting the smiles of Aurora, and the angry flash of the tempest, are equally exact expressions of the unwavering formula; and the geological Titans, sons of Vulcan and Neptune, who once piled Pelion upon Ossa and strewed the earth with the fragments of their battles, and more recently have arrayed the armies of science in unnatural conflict, are at length bound to the primitive rock of immutable law, by the same strong, embracing, golden chain of inductive argument, with which our Franklin "dragged the thunderer down to earth."

Every new discovery in science has now become a new conquest to geometry. Quantitative analysis is regarded as the only safe instrument of research, and the question of the "What kind?" is universally merged into that of the "How much?" This is not limited to the physical sciences; even in politics, the statesman, finding in each land all kinds of men and every element of public economy, is forced to inquire how much there is of each, and to be guided, in the conduct of government, by the figures of statistics. Can it, then, be otherwise than that the science which takes especial charge

of the theory and laws of exact measurement should be of universal application? However distorted it may be in its technical forms, and diverted from its natural position by the injudicious zeal of its votaries, its fundamental principles are those of sound logic and good common-sense, and whatever it touches it elucidates and illuminates. There are many questions in which it might be advantageously consulted further than has yet been done, and it appears to me that the difficulty in regard to the claims to discovery would often be settled by its judicious application, although it might sometimes, perhaps, be tempted to divide an ill-begotten child with the sword of justice, so as to give each claimant his worthless share. But it would grant no countenance to that miserable spirit of scientific adventure, which, by a moderate fertility in suggesting possible solutions of an abstruse problem, lays the foundation for a claim adverse to the just rights of him who, by exact and profound investigation, has demonstrated the true doctrine. By the severity of the standard which it would establish, it might even compel science to renounce some of its pretended acquisitions. In Astronomy, for instance, it must be conceded that Saturn and Jupiter, Mars and Venus, are yet subject to unexplained irregularities of motion; that the theory of the asteroids has not advanced beyond the earliest stage of arithmetic; that the rings of Saturn are connected with their primary by a force not less mysterious than that which holds its golden representative upon the finger of the fair betrothed; and that the laws under which the tides obey the attractions of the sun and moon are quite undeveloped. The remarkable researches upon this subject made in the Coast Survey, have established that here still remains another world to be conquered, worthy the ambition of the Alexander of Geodesy.

There is, however, a broader basis than that of numerical accuracy for maintaining the central position of Geometry among the sciences. It is that of form; the grand type of structural combination. This element may often be deficient

in the technical mathematician, but it is the characteristic feature of the imperial intellects of geometry, of Archimedes and Hipparchus, Newton and Leibnitz, Laplace and Lagrange, Monge and Gauss. It equally belongs to great ability in every department of knowledge and art, and directs all successful effort, from the brilliant campaign of the conqueror to the invention of the printing-press. It is the alpha and omega of intelligible speech, the architect of the poetic temple, the founder of empires, and the maker of constitutions. It is the power of combining innumerable details into a consistent whole, the highest exertion of human genius, and that which approaches nearest to the act of creation. It deciphers the hieroglyphic of events, and, uniting the present with the past and the future, it is the veracity of history and the inspiration of prophecy. It planned the vast fabric of the Reformation, and it touched with its miraculous finger the eyeballs of that statesman who foresaw, in its full development, the mighty tree which now overshadows this continent, when it was concentrated in the seed of liberty, and just germinating in the blood of the patriot. But with all its grandeur, this principle is subject to the laws of necessity and exactness, and when it ventures to build upon the sands of hypothesis and speculation, or the quicksands of *a priori* argument, the fall of its cathedral is certain, and only hastened by the weight of the massive towers. The rash system of philosophy which, despising the science it cannot comprehend, presumes to soar capriciously above the well-established theories of inductive demonstration, must melt its ill-cemented pinions as it approaches the source of truth, and sink, like Icarus, into deserved ridicule and contempt. The imagination of the immortal Kepler himself would have wasted all its strength in a wild and whimsical race with the mysteries of cosmography, if it had not been restrained from its extravagance by his sincere love of truth, and soberly harnessed to the observations of Tycho. The gaudy firmament of the artificial globe of the astronomer's studio is a singular illustration of the impossi-

bility of devising a well-ordered plan, when there are no proper materials for classification and distribution. For more than twice the period of the millennium, the most savage beasts and horrible giants have been sporting upon it with infants and gentle maidens, and have clustered the stars in the mingled confusion of the wilderness and the nursery. The additions which modern taste and sycophancy have made to this curiosity-shop have not diminished its peculiar interest, increased its classic elegance, or relieved the perplexed interweaving of the constellations.

But the exactness required in the development of form is that of unity, order, and continuity, more than that of number; and it is better expressed in the curve than in the formula. Such accuracy may be developed in its highest perfection, in minds to which the processes of arithmetical computation are utterly distasteful. There is one, whom I am proud to call my friend, to whom I have more than once tried to communicate some conception of algebraic analysis and its modes of research. Whether the fault was in the obscurity of the teacher, or the too great density of the pupil's brain, my excess of modesty dares not decide. Whatever was the cause, the attempt was a total failure; I could not bring my friend to comprehend the product of two by two, when both the twos were negative; and I am firmly convinced that he would rather have yielded his fine teeth to the dentist, than his radical and absurd repugnance to the extraction of an impossible root. But of all men who ever set foot upon American soil, there is not one who has made so many and so great scientific discoveries as this man; there is not one who has opened so many new treasures of knowledge; and, paradoxical as it may seem, he has unlocked every door with the key of geometry. How was it, for instance, that he drew the outline of the fossil fish, from that of the single scale? and how did it happen that the original lithograph, when it was discovered, was identical with his design? When he was challenged before the British Association to portray the form of fish proper

to a geological stratum in which he did not know that one was found, what power guided the hand which held the chalk? And when the cloth was removed, which, to his surprise, concealed the newly discovered fish, how and where came the extraordinary coincidence? and whence did they acquire the selfsame lineaments with the drawing upon the blackboard? To what other science than that of form is such a wonderful knowledge of form to be attributed? And are we not sorely tempted to confound all scientific distinctions, and claim him, even against his will, as one of the greatest of geometers, who has advanced the science far beyond the highest flight of the transcendental formula into the domain of the organic kingdom? When he was commissioned by the illustrious chief of the Coast Survey to examine the reefs of Florida, by what a consummate mathematical logic did he trace back their history for more than a thousand centuries, to the probable beginning of the present geological period!

Of the many difficult questions with which science is disturbed, none are so serious as those which are connected with religion. There are men, and pious men too, who seem honestly to think that science and religion are naturally opposed to each other; than which I cannot conceive a more monstrous absurdity. How can there be a more faithless species of infidelity, than to believe that the Deity has written his word upon the material universe and a contradiction of it in the Gospel? And is it possible that such a belief has ever been seriously professed? Or is the other alternative less unreasonable, that the serpent has wound its coils around the tree of knowledge, and that the alluring fruit which has been dropping at the foot of man from the days of Adam to those of Newton, is poisoned to its core? Shall we believe that the voices of Nature are the songs of the Siren and the artful temptations of the Devil, to divert man from his devotions? If this be so, how singularly forgetful has the Enemy been of his interests, or how divided against himself and his own

household, that he is thus praising God and magnifying him for ever, "in all the works of creation; in the sun and moon, and the stars of heaven; in the showers and dew; in the winds; the fire and heat; the winter and summer; the light and darkness; the lightnings and clouds; the mountains and hills; and all the green things upon the earth"! that he is "for ever blessing the Lord in the whales and all that move in the waters; in the fowls of the air; and in the beasts and cattle"! Can it be that this universal anthem, this all-resounding chorus of hallelujah, is a cunning device of hell to gain the souls of men? and that the arch-hypocrite stole from the fire upon the tongues of the holy children whom he dared not touch? and that he has ventured behind the altar into the inmost sanctuary of the church, in the garb of a high-priest, and inscribed the sublime canticle upon the book of prayer, with the pen which was dipped in the blood of Christ? Or is it to be supposed that unconscious matter has abjured its Creator, and, having no will, has fallen with the infinite sin of man's rebellion, melting in the fires of its volcano the impress of the seal of approbation which was imprinted on the day of creation? Such absurd hypotheses may, in this age, be left to their own refutation.

There is proof enough furnished by every science, but by none more than by geometry, that the world to which we have been allotted is peculiarly adapted to our minds, and admirably fitted to promote our intellectual progress. There can be no reasonable doubt that it was part of the Creator's plan. How easily might the whole order have been transposed! How readily might we have been assigned to some complicated system which our feeble and finite powers could not have unravelled! to some one, perchance, of the stars, in the immense cluster of Hercules, where "the countless and unending orbs" are "in mazy motion intermingled," and where,

> "Above, below, around,
> The circling systems form
> A wilderness of harmony,"

the sound of which would never have penetrated to the desolate heart of man, nor have stirred his motionless spirit to a divine thought!

What a contrast to this humanly incomprehensible world is that in which we have our being, where the obvious simplicity and regularity of the daily phenomena invite our contemplation with so fine and irresistible a persuasion; where all the developments of art and nature occur in a happy and consistent gradation, ascending amid innumerable forms of beauty to the temple of science! Had it been the sole object of the physical universe to contribute to our intellectual nutriment, its arrangements could not have been more skilfully contrived. The angel of the Lord is ever sent with the message of new truth at the time when it is most welcome, when the heart of philosophy is heavy with the obscure mists which hang over the paths of knowledge, or when the faith of the fainting world requires the reviving influence of some brilliant discovery. How wonderful are the relations in the progress of the observing and the abstract sciences! With what a profound harmony do they sustain their several parts in the heaven-born symphony! Attracted by the symmetry of a few graceful curves, geometry undertook their investigation, and prosecuted the study of their curious and intricate properties, until ridicule threatened to point at such a useless expenditure of labor. But when, in the course of its revolving cycles, astronomy had grown to its grand era, it began by preaching to the astounded doctors of theology the amazing fact that these selfsame curves have been drawn, by the Creator's own hand, from the beginning of time, in the paths of the planet, the comet, and our own fixed earth; and thenceforth the treatise upon conic sections has become a chapter of the celestial Principia. And so it has ever been; in the ambitious flights to which geometry has been impelled by its impatience of the restraints of observation, it has never soared above the Almighty presence. And so it must ever be; the true thought of the created mind must have had its origin from the Crea-

tor; but with him thought is reality. It must then be that the loftiest conceptions of transcendental mathematics have been outwardly formed, in their complete expression and manifestation, in some region or other of the physical world; and that there must always be interwoven with the discoveries of observation these striking coincidences of human thought and nature's law. They are the reflections of the divine image of man's spirit from the clear surface of the eternal fountain of truth. Is then religion so false to God as to avert its face from science? Is the Church willing to declare a divorce of this holy marriage tie? Can she afford to renounce the external proofs of a God, having sympathy with man? Dare she excommunicate science, and answer at the judgment for the souls which are thus reluctantly compelled to infidelity? We reject the authority of the blind Scribes and Pharisees, who have hidden themselves from the light of heaven under such a darkness of bigotry. We claim our just rights and our share in the Church. The man of science is a man, and knows sin as much as other men, and equally with other men he needs the salvation of the Gospel. We acknowledge that the revelations of the physical world are addressed to the head, and do not minister to the wants of the heart; we acknowledge that science has no authority to interfere with the Scriptures and perplex the Holy Writ with forced and impossible constructions of language. This admission does not derogate from the dignity of science; and we claim that the sanctity of the Bible is equally undisturbed by the denial that it was endowed with authority over the truths of physical science. But we, nevertheless, as sons of men, claim our share in its messages of forgiveness, and will not be hindered of our inheritance by the unintelligible technicalities of sectarianism; as children, we kneel to the Church, and implore its sustenance, and entreat the constant aid and countenance of those great and good men who are its faithful servants and its surest support, whose presence and cheering sympathies are a perpetual benediction, and among whom shine the brightest lights of

science as well as of religion. Moreover, as scientific men, we need the Bible to strengthen and confirm our faith in a supreme intellectual Power, to assure us that we are not imposing our forms of thought upon a fortuitous combination of dislocated atoms, but that we may study His works humbly, hopefully, and trusting that the treasury is not yet exhausted, but that there is still left an infinite vein of spiritual ore to be worked by American intellect.

Gentlemen of the American Association, I cannot conclude without a few words to recall our duty to the country to which we owe our allegiance. We must despise the base servility to foreign superiority, which affects to look down from the heights of the cosmopolite upon the duty of patriotism, and scorn it as an abomination. We must love our country with the same devoted, noble, and generous love which inspired the lives of Niebuhr and Arago, of Bowditch and our late lamented Walker, which is the living fountain of the labors of men like Humboldt, Henry, and Bache, which won for Franklin the affection, admiration, and reverence of France, and without which there can be no worthy respect and esteem for the labors of the men of other nations. The heart which is too small to hold its own country cannot assume to embrace the whole world, and still less to contain a science. Of all the virtues, patriotism is the least selfish, and that which is most kindred to the grand sentiments of the heroic soul. It repels foreign arrogance with dignified contempt, its proud spirit rejoices to do homage to true greatness wherever it may be found, and it frankly opens its hospitable door to the reception of the learned guest of every land. It was the larger half of the greatest name in history, and from the tomb of Washington it invokes us to be faithful to posterity.

The time is ripe for some important improvement in the public condition of science and its relations to government. For the first time in the history of the republic, "the men of genius of our country, who, by their inventions and discoveries in science and art, have contributed largely to the improve-

ments of the age, without in many instances securing for themselves anything like an adequate reward," have been commended to the favorable consideration of Congress by our Chief Magistrate. For this great and good word, let the benedictions of science rest upon his head. It is now our fault if the occasion be not properly improved. No government, in proportion to its opportunities, has surpassed our own in its readiness to promote science. The Coast Survey, the National Observatory, the Nautical Almanac, the military and naval academies, the expeditions for astronomical and other scientific purposes, and the munificent grants for special researches, are conclusive evidence of the willingness to advance high and useful forms of philosophical inquiry. The confidence which has been inspired in other countries is shown in the trust of that magnificent endowment for the diffusion of knowledge to all mankind, under whose roof we are here assembled. The provisions for the election of the Board of Regents and the choice of a Secretary, upon the singleness of whose integrity and the largeness of whose comprehension are concentrated the hope and confidence of his scientific brethren throughout the world, are a guaranty that the honor of the republic will be held sacred in the discharge of this high charity, and that it will not be diverted into *any local channel* from the enlarged intentions of its testator. Let us profit by the example of Smithson, and, instructed by the wisdom of this high-minded son of England, learn to confide in our own rulers. Let us be aroused to an earnest and harmonious effort to accomplish the plan proposed by our President at Albany, for the building up of an "*institution for science, supplementary to existing institutions, to guide public action in reference to scientific matters.*" With the details of the plan and the arguments in its favor you are familiar. You know how useful it would be as a protection from the wasteful expenditure upon abortive attempts to reverse the laws of nature. You know how much it is required to sustain the purity and independence of science, even within its

own proper domain. You know that in no age or country was there ever a more urgent call for a scientific society, in which scientific influence should predominate, where it should not be smothered by excess of patronage, and whence it should not be liable to banishment through any spirit or form of ostracism. If American genius is not fettered by the chains of necessity, and helplessly exposed to the assaults of envious mediocrity, but is generously nourished in the bosom of liberty, it will joyfully expand its free wings, and soar with the eagle to the conquest of the skies.