AN ADDRESS, DELIVERED BEFORE THE PITTSBURGH PHILOSOPHICAL SOCIETY

By

Robert Bruce

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DELIVERED BEFORE THE

PITTSBURGH PHILOSOPHICAL SOCIETY.

BY ROBERT BRUCE, D. D.
PRESIDENT OF THE SOCIETY.

JULY 3, 1828.

PITTSBURGH.

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1828.

EXTRACT FROM THE MINUTES.

At a stated meeting of the "PITTSBURGH PHILOSOPHICAL SOCIETY," held at the University Buildingss, July 3rd, 1828, it was, on motion of John Black, D. D.

Resolved, That the thanks of the Society be tendered to the President for his address, and that he be respectfully requested to furnish a copy for publication.

J. T. STOXE, Rec. Sec'y.

AN ADDRESS, &c.

GENTLEMEN,—The desire of knowledge is natural to man; and the sciences have been cultivated in some degree in all ages. The attainments of the ancients, indeed, in the different departments of natural science, were, like their knowledge of the geography of the world, very circumscribed on the whole, and even strikingly imperfect in some parts. They devoted much of their attention to moral science, history, and literature, and in these, they greatly excelled. The mind of an individual may, like that of Homer, exhibit, even in poetical excellence, these subjects; but the fabric of natural science must be reared on the basis of observation and experiment; and as the former of these can be carried on only by an infinite variety of artificial contrivances, as instruments; and the latter by the same; and these guided by an infinitely varied process to attain the desired object, its progress was scarcely commenced among the ancients, and in its own nature it is extremely slow.

The moderns, however, have displayed great personal activity, have organized their strength, and have been wonderfully successful. Their geographical knowledge of the world encompasses the globe, and condescends with admirable accuracy to every sea, lake, mountain, and island; and their scientifical researches, also, have left no quarter of either the heavens or the earth unexplored.

Three things have wonderfully contributed to the success of the moderns: the art of printing, the freedom of inquiry which sprung up with it and is protected by the spirit of the Reformation, and the formation of philosophical societies and scientific academies. The art of printing gives wings to every new discovery, and carries it through the whole circle of literary men, exciting their emulation, and suggesting a thousand analogies—the parents of new pursuits and of new discoveries. Where the opinions of men are chained down always to quadrate with a particular religious creed, and imprisonment or death is the sure reward of free-

dom of thought or independence of investigation, a timid and often a hesitating course is necessarily the consequence. Philosophers may boast of the freedom they now enjoy, and may improve the privileges which the times and circumstances of the world have bestowed upon them; but assuredly it was the spirit of religion, and a sense of the majesty of conscience, which fought the battle with intolerance, and subdued its dominion so as to permit a free and undisturbed research into all the works of nature. We do not mean, that, in what is emphatically called the dark ages, some bright discoveries were not made. We know that either by accident or research some very fundamental truths appeared in natural science in these ages, and which indeed have become a wonderful stimulus in every future period. Such, for instance, is the discovery of the polarity of the loadstone. Whether this fact in natural science was borrowed from the east, where it has been long known, or whether it was a discovery by the Europeans themselves, as is more generally supposed; yet, certain it is, that it has been like a benign angel which Providence had sent to promote knowledge, civilization, and unity among the tribes and nations of the human race. But on the supposition that philosophers had always remained in their closet, or solitary in their walks, little real progress could have been made, though every discovery had been printed, and though an uninterrupted freedom of circulation of it had been granted, compared with the rich and extensive possessions of knowledge, which, under organized societies and academies, the world possesses. These social institutions try the pretensions of every new discovery, and prevent impositions on the public, which, by bold adventurers and wild theorists, were, previous to their formation, so common; they make men proceed with the greatest circumspection in the establishment of the objects of their pursuit; the criticisms which, enlightened from habit, and unsparing from emulation, take place in them, stimulate exertion, both in the person who has originally taken up the subject, and in others who may immediately turn their attention to that line of pursuit where fame is supposed to be in prospect; and which is the most momentous consideration, whatever light may be stricken out under all this stimulated heat of action, be it small or be it great, is registered in a faithful delineation, that it may remain either as

an attempt at it, or as part of the real progress of the human family, in arts and sciences.

These literary and scientific institutions are much more numerous than one, little acquainted with the history of modern literature and science, would be apt to imagine. There is not a city of any magnitude in any of the European nations, in which some of them are not to be found. Italy was among the first of the European countries which adopted the plan of promoting the departments of natural science by public academies and societies; and Turin, Bologna, Milan, Genoa, Florence, Naples, and Venice, till the present time, have flourishing cabinets of natural curiosities, and specimens of art; while their records contain descriptions of every curiosity that has excited a deep interest; a statement respecting the discovery of every important fact; and disquisitions on all subjects where theory is legitimately admissible. Spain had once some very flourishing literary and philosophical societies, of which there still exist those of Madrid, Cadiz, and Burgos, which have purified and perfected the Spanish language, and made some interesting improvements in natural history; particularly through their members who emigrated to South America, or were employed there for a time by the government.

Even Portugal, which had once such extensive connexions both in the east and west, has treasured up in the records of her academies and societies, many more precious accounts respecting the manners of the people and the natural productions of the countries over which she once swayed her sceptre, than the managers of these societies have yet seen proper to publish, though they have published some which are particularly interesting. France for the last two centuries has stood eminent in every department of literature and science: But she seems to have done so principally because of the peculiar organization of her public institutions. The government early fostered these institutions, paying salaries to eminent men, and aiding in other respects their operations, by suitable apparatus. Besides the French academy, latterly moulded into the National Institute, there are, in Lisle, Bourdeaux, Lions, and indeed in almost every town, very active and flourishing societies for prosecuting almost every branch of natural science. The country of Switzerland, among the Alps, enjoys great advantages in mineralo-

gical pursuits, and for this, as well as other branches of knowledge, she has many societies; the published transactions of which bear eminent testimony to the enterprise and intelligence of their members. The rest of the continent of Europe was, for the most part, later in commencing its career; but Austria has opened her treasure to support an association of her philosophers, and to provide for the improvement of science under their hand; Russia has appropriated thousands for the same object; whilePrussia was earlier than either of them, and while her societies are inferior to none in the world for activity and success. London began with the Philosophical, now the Royal Society; but its societies for the pursuit of literature and science, are nearly now as numerous as are the branches of natural knowledge; and while some of them have palaces in which to meet, more splendid than that of their king, almost all of them seem to be actuated by the genuine spirit and industry of philosophy. The rest of the towns of the British empire imitate the metropolis, and some of them, like Dublin, Manchester, and Edinburgh, publish their transactions, in which are many most valuable papers on subjects in all departments of knowledge. Our own country has not a city of any eminence without literary and philosophical societies; lending a hand to aid in the great improvements of the world, which have already advanced so far, and which notwithstanding, admit of still farther advances, in an indefinite degree, in every branch of science and art.

These societies, in estimating the amount of their labors, must not be considered as absolutely distinct from the colleges that are to be met with in every civilized country; for the most eminent of the professors in such colleges, are active members of these societies, and it is generally among their transactions that the discoveries and improvements of such men are deposited, as well as by means of them that their most valuable original papers are published to the world.

These institutions, thus aided by all the scientific men in the world, have made us almost perfectly acquainted with every continent, peninsula, island, ocean, sea, river, and lake, on the face of the earth: They have separated the fabulous from the true history of the nations in the early period of our world; and they have cultivated, to an amazing de-

gree, a knowledge of every minute object which land or water, air, or starry firmament, in ancient or modern times, have displayed.

The vegetable kingdom, various as are its productions, has almost all passed under their review; and there is scarce a flower which opens in the fertile field or barren wilderness, in the rich vale or on the towering mountain, the seed of which they have not studied, in its size, medicinal properties, and philosophy of germination; the stem of which they have not examined in its internal structure, and the teguments which cover it, in the number of branches into which it may divide, and the angle by which they separate; the leaves of which they have not marked in the shade of green under which they grow, their figure, and the fibres which ramify through them; and the petals and pistils of which they have not counted, and rigidly assorted with all of the species, to the proper department in botanical history. To the more useful vegetables they have given a still more particular attention. They have studied how each species and variety can be improved; what soil is best suited to their nourishment; how they can be won from the habits of one climate to wear those of another; and how by the aid of fires in winter, and the modification of the sun's rays in spring and summer, they may, at their pleasure, raise in very high latitudes the productions of the torrid zone. In respect to the more lofty vegetables, they have ascertained their appearances in every clime; and tell us of every tree in respect to the strength of its materials as compared with its own specific gravity, and as compared with the strength of other species; they teach the mechanic what each kind will bear when subjected to a cross strain, and what when it is attempted to draw it fairly asunder.

They have taken up every insect which creeps on the ground, or lives on the leaf of any green thing, or which sports in the summer's ray; and applying glasses of high magnifying powers to an examination of its appearance, they have led, by their descriptions of unnoticed and even despised objects, to higher views of the wisdom of the universal Creator. The economy of the bee was long admired, though but imperfectly understood; but the ant is now shown to be a more intelligent builder, to have equal laws of order and obedience, and to construct one of those heaps which we pass

unnoticed by the way side, with more wisdom of arrangement within, than ancient Babylon displayed within her lofty walls; and many of the smaller insects are not inferior in political and municipal attainments.—The very worms they have hunted from their dens, and have descriptions of their simple habits of life, of the food which is most agreeable to them, and of the age to which many of the species prolong their existence. The serpent races, from the great boa to the meanest of the tribe, have been invited to aid the pursuits of philosophy, and their method of communicating existence to a subsequent generation has been ascertained; their feebleness and distress when divesting themselves of their exuviæ; the structure of their belly, by which they can make such rapid progress in journeying; the jointing of the vertebræ of their back, as intended for this purpose; the character of their tusks and the bag connected with them, which in many species contain their deadly poison; and their state during hibernation, in which, though apparently lifeless, all of them are yet found to breathe, and in a very regular, though slow manner; all these things are strikingly delineated.

The quadrupeds are the most interesting to man, and in all ages there has been some considerable knowledge of them. This, however, was, till within these two hundred years, very imperfect. Men knew something of their external structure and color; but their knowledge of them was generally restricted to that of a few of the species in their own country; whereas now the philosopher knows the anatomical structure of every species; the small differences which mark every variety, from one extremity of the globe to another. He knows the history of their domestic economy, their adventures in procuring their food, and their loves and enmities. He knows, too, what vast influence domestication has had upon some of the species, and how all of them, if it be his object to do so, may be improved in their kind. England has derived immense advantages to her agriculture and her manufactures, in the improvement of the breed of her domestic animals.

The winged tribes have been, over almost the whole face of the earth, examined; the proportional length of every feather to the habits of the bird, has been ascertained; the color which brightens on some particular feathers, in certain

species, in a certain angle with the sun, has been marked; the anatomy of the neck and legs of other tribes, where, from their modes of gathering subsistence, great length is requisite, and yet where the head would become an insupportable burden, if the neck could not contract at pleasure, has been brought forward to our admiration; and the times of migration of many of the species, the ages to which they live, and the parental affection which different kinds, according as a call for protection requires it, exhibit, are all so minutely detailed, that no study is more pleasing, or leads to more striking views of the provisionary arrangements of Providence, than that of our present ornithology.

But philosophers have not satisfied themselves with the knowledge of animated or vegetable objects on the land: they have fished in all waters; and have an astonishing library of knowledge to present to us respecting the history and habits of the inhabitants of our rivers, lakes, and the sea. There are several curious questions which have been answered on this subject. What is the anatomical structure which best suits to the instincts and habits of different kinds of fishes? How, since in very deep water no light from the sun can aid them in procuring their food, are they guided to to it? What is it on which some of the species are fed, since no vegetable substance, nor small fish are found in their stomach? And what creates that light which in the dark is always seen in the track of a vessel near the borders of the sea? The structure of fishes is extremely different; but it has been ascertained with considerable precision, that the curvature of each, and the length of fin belonging to it, are always indicative of certain instincts which require a certain force of motion, and which, were the fish to be more or less resisted than this curvature and fin bespeak, the species, in the great game which is played in the ocean for life, would either be itself destroyed, or would increase and flourish out of all proportion. In the records of several philosophical societies, it is stated, that those fish which live at the bottom of the abyss, have all a phosphorescent power, by which they shed a few rays of light around them, which are sufficient to guide their path. The herring, a numerous species, are never caught with any kind of fish which they have devoured: How then are they fed? There is always food in their stomach, and the transactions of certain philosophical

societies tell how they have been provided with it. What gives the green color to sea water near the shore, (for in the main ocean it is not green,) they state, is the animalculæ which swim in the water, and on which, as on the breast of their mother, the herring live, by sucking them. These same animalculæ produce that phosphorescent light which is seen in the dark in the path a vessel has pursued. When a quantity of this water is poured into a glass, and watched with sufficient care, the little animals which are contained in it, often, after it has become perfectly tranquil, are seen to display their lamp, and with a good microscope may be distinctly perceived moving and sporting in the water. Sometimes again, when the glass is touched, they instantly disappear, and their joy seems ended through fear; but at other times, when the water has been quiescent, and they have remained in darkness, a sudden agitation seems to alarm them, and they immediately light their fires as if to look out for the cause of unexpected danger.

But it is not the vegetable and animal kingdom which the transactions of the philosophical societies make us acquainted with; they have investigated unorganized nature, and have arrived at results still more astonishing than any we have related. While other men were gathering from the surface of the earth, or dragging from the ocean, or digging from the bowels of the world, what form the riches and support of men, the philosophers were raking from the ground the exuviæ of former ages, and digging for shells in ancient beds of the ocean. Many species of animals, both by land and sea, they have discovered to have once existed, of which there is now no known specimen alive, on the face of the earth.

They have introduced a particular scientific manner of procedure into their mode of searching for these early productions of our world. They have taken a minute of the strata of rocks which lie incumbent one on another, and have ascertained that these strata are shells which encompass the whole globe. In many instances they vary in their depth, and often they disappear for a time altogether; but when again they reappear, it is always under the layers which were before superincumbent, and always superior to those on which they before rested. They have ascertained that the crust of our earth is formed of certain coatings, which,

though with some openings in them, are the same all over the body of the earth; and in each of which such and such remains are always to be found. The marine exuviæ occupy the lowest strata, and are almost altogether different from the spoils of any living creature which our present seas contain. Above these are other marine productions and the spoils of land animals, now no longer to be met with alive in any clime. And above these, are petrifactions of animals known in some degree to our present seas, and to our fields and forests. On the surface of all, lie alluvial soils, in which are the bones and skeletons of some animals now indeed unknown to us, but generally of those of our present races both by sea and land. All that they have found of organized remains, they have carefully compared, both among themselves, and also with the anatomical structure of the present generations, and are thus enabled to state with precision how many genera and species of the ancient inhabitants of our globe have become extinct by the hand of time, and how many have survived. The more perfect genera and species still remain, and among all the petrifactions which have been discovered, there is but one specimen, from an island in the West Indies, of any thing like the petrifaction of human bones.

But philosophers have not satisfied themselves with examining the rich stores of organized remains which are imbedded in the different strata of our planet; they have subjected these strata themselves to a complete analysis. The characteristics of every formation they have noted, whether it be lamellar, schistose, columnar, or rhomboidal; the specific gravity of each they have placed in their tables; and if any of them contain crystalizations, the angle, and degree of transparency belonging to each crystal, is accurately placed before us. They have done more; they have torn asunder the minutest particles of the strata which form the crust of our earth; and have ascertained the elements of which these particles are composed. The limestone, for instance, they have found to be formed of a metal, the vital air which we breathe, and the carbon which forms a part of every vegetable on the face of the earth.

The ingenious papers which are contained in philosophical societies, investigate other inquiries about our earth, such as how deep the heat of the sun ever penetrates; whe-

ther after the influence of the sun's heat ceases to be felt at a certain depth under the surface, the earth maintains the same temperature downwards, or whether it increases or decreases. The alteration of temperature by the sun's influence never penetrates, they have ascertained, to the depth of one hundred feet; and our earth, among the strata immediately under this limit of the sun's influence, is found to have the same temperature with the mean temperature of the latitude, but it gradually becomes warmer the nearer the centre of the earth we proceed. Having ascertained all the easily detected properties of heat, such as its radiation in straight lines, its refrangibility, its transmission far better under some colors than others, its latent condition in all bodies, and its expansive power over all substances; they have endeavored to ascertain its nature, whether it be an independent material existence, or only a property in material bodies which is excited into action by the operation of other material bodies upon them. The question is indeed yet not satisfactorily decided; but this much has been discovered, that in vacuo an active pressure on the end of a hard steel cylinder, though very small, excites a quantity of caloric which is wonderfully powerful, and which seems to proceed from a source which is absolutely inexhaustible.

Their inquiries on light are almost as boundless as is its range. Light, whatever may be its nature, appears to be a citizen of the universe, and never thinks of returning home to the abode from which it issued. So since Rhœmer measured its velocity, and Newton separated the primitive rays, there have been respecting the refractive powers of different media, respecting their dispersive qualities, and respecting the polarization of light, discoveries, which amaze us by their extent, and would seem to bewilder us, as when we look to the sun, by the suffusion of the light of knowledge which they pour upon us.

But the records of philosophical societies do not content themselves with the researches of philosophy in our planet; they have taken the heavens under their inspection; and as if to astonish us out of measure, at the powers of the human mind and the brilliancy of human discovery, they have guided the eye to the most distant objects in the heavens, by gathering the sand from our rivers and the ashes from our fires, and preparing the aids of vision from these materials.

Of the heavens, indeed, they could have little accurate knowledge unless mathematical problems of the most difficult construction were settled, unless theorems of the most intricate nature were investigated, unless equations of the most perplexing order were resolved, and unless differentiations and integrations of the most involved kind were stated and applied; but all this they have done, in even a more triumphant manner, than they have observed and registered the facts of philosophy. The mathematical papers which are found in some of our philosophical societies, seem equally the birth of genius, the evidence of powerful intellect, and the fruit of unwearied patience. If the immateriality of the soul were any way doubtful, the accumulation of abstract reflections, the thousand ways in which quantity and number are all made subservient to the rearing of the most noble and permanent fabric that our world has to boast, in the present state of the mathematics and their successful application to the resolution of all the distant phenomena of the heavens, would put it beyond a doubt. The properties of matter are extension, figure, solidity, divisibility, motion, and attraction, and the attributes of mind are a power of comparing, remembering, and willing; and while the essence of both is absolutely unknown, there is such a purity of intellectual process carried to an amazing extent here, that we cannot but consider mind to be as distinct from matter, as the mathematical reasoning is distinct from the material objects to which it is applied.—These philosophers have accounted for evey change which we see taking place in the heavens. The solar system has been detected as moving towards a certain point among the constellations; the centre of this system, though always within the sun, is shown to be constantly changing; and yet, by Dalambert's principle of the equilibrium of forces, they tell us how to find its place for any given instant of time; the amount of alteration in right ascension, declination and longitude of the fixed stars, by the recession of the equinoxes, is calculated; the motions, though so irregular, of the moon, the secular equations of jupiter and saturn, and even the periods and paths of some of the comets, are all settled to an astonishing degree of accuracy.

They are not, however, all things around him in the earth and in the heavens, of which man has attained, in modern times, an astonishing knowledge; he has laid

open a world of wonders in his own frame. The ancients, like the heathens of modern times, were afraid to apply the dissecting knife to the sacred frame of the human body, and learned all their knowledge of it, by its supposed analogies to other creatures, often of very different anatomical structure; and were not only ignorant of the relations of the members of their own body, but established in false hypotheses respecting them. But the moderns have become accurately acquainted with the structure of the whole skeleton of the bones, the ramification of the nerves, the nature and functions of the muscles, the positions and influence of the ligaments and cartilages, the secretions appropriate to each gland, the circulation of the blood, the source of vital heat, and the causes and cures of many of those maladies which deprive human life of the sweets of enjoyment.

But it is not science alone to which philosophical societies have turned their successful attention, the arts have been also taken under their care. They have ventured to suggest the means of improving the soils of the earth, and to put into the hand of the husbandman the best constructed implements for success in his work. They have constructed machinery for the threshing of his grain, the carding of his wool and cotton, and the spinning and weaving, the dying and dressing of them. They have led the architect to elegance of design, by the rules of taste which they have investigated, and by the specimens of ancient buildings which, as perfect models, they have brought to his view. They have taught the manufacturer the principle of power which he is to use, the best means of its application, the diameter and pitch of each wheel, which, in the whole complication of machinery, he is to employ, and the adjustment throughout the most extensive manufactory, of each part, so as to make the most harmonious whole. They have afforded the best models to the ship-builder; instructed him in the best trim of the sails, and made him acquainted with finding a ship's place on the globe, by the unerring method of celestial observations. In a word, while they have cultivated a science in music which is truly ennobling, they have perfected, both by chemical process and mechanical structure, every instrument which is useful to the eye, which can measure time, or which can adjust weight; which can estimate

the degree of heat or moisture which is in the atmosphere; which can ascertain the velocity of the wind, or the temperature of the different latitudes of the ocean; and which can show the movements of our earth, and all her sister planets in their ellipticalo rbits around the sun. They have improved machinery to be elegant and harmonious, they have connected it with principles of power which are equally energetic and under the laws of control, and they have set it, under the ingenuity of their designs, to ease the toils and relieve the labor of the human family. But it is impossible to particularize the scientific improvements in the arts.—When Columbus found out America it was an almost universal wilderness; but now it is covered with plantations which grow the produce of every clime; and this is an emblem of the successful labors of the men of science, in the improvement of the arts. The whole face of society is changed, and the wilderness has become a fruitful field.

But the life of man, Gentlemen, is extremely short, and no parent has the power of conveying, by an arbitrary will, the inheritance of his knowledge to his children. The rising generation have always to learn all which the philosophers of former ages have investigated and ascertained.

Our society has been formed to aid us, and others who may see meet to join it; as, in a great measure, we are all little acquainted with the philosophical attainments, which, in the different branches of science, the world possesses; and, as we ought not, for our own sakes, and the sakes of others, to remain contentedly so, in our happy country and flourishing city.

The situation, relations, and prospects of Pittsburgh, Gentlemen, have claims upon its citizens equal to most cities in the world. Its prospects are excelled by few. The canals and rail-roads which connect it with all the flourishing cities towards the east, and with the commerce of Europe, which, though immediately terminating in these cities, must receive its most extended and permanent support from the vast regions towards the west; and the Ohio which connects Pittsburgh with all these fertile western regions, say that our city has prospects solid as are her inexhaustible mines for the support of her manufactories, and permanent as are the streams which flow by her. But is Pittsburgh to become one of the first cities in commerce and manufactures

in the world, and her population to remain ignorant of that science which is no less ennobling to the human mind, than it is the solid basis of the prosperity of any place, in the present highly improved state of society and of the arts? No, Gentlemen, we must recollect, that it is by unwearied industry and perseverance that we can, in any degree, become acquainted with the various branches of the sciences and the arts as they now exist; and while our society is formed for our own mutual improvement, it is not more as insulated individuals who might covet the sweets of knowledge, nor as general philosophers, who might enlighten the world around them, that we are to exert ourselves, than it is as inhabitants of Pittsburgh—a place to which great wealth must flow, and where almost every art, which requires science to provide its materials, and to preside over their operation, will flourish. Agriculture has a claim on our assistance to improve our surrounding country, that the growth of our city may be in no degree impeded by the difficulty of procuring subsistence; our manufactures, while they may greatly flourish under the practical experience of our industrious citizens, yet, if possible, should be examined and improved under the eye of science; and our navigation should be aided by every suggestion respecting economy, safety, and facility. We should examine our surrounding botany, and our mineralogy, and we should reach by correspondence, our inquiries respecting these subjects, to the borders of our great lakes, and to the regions of the Mississippi and Missouri. Yes, Gentlemen, our society having commenced, should provide itself with an apparatus, as full and as perfect, as it can; and while it may keep in view the contributing a little, perhaps, to the general current of improvement which has now such a full stream and a rapid flow, our main object, for a long time, must be to enter ourselves as scholars, to be taught what is already known; and to commence the operations of a society, which the place, where Providence has assigned us our lot, has a right to call her citizens, however little practised in philosophical pursuits and investigations they may be, to attempt to commence and steadfastly to prosecute.

And in conclusion, Gentlemen, permit me to remark, that the benediction which will arise, on the whole, as an unction to our understandings, from the eminent attainments we are

about to contemplate in natural science, will be, that, while all tend to illustrate the perfection of infinite wisdom and power, they will change the aspect of philosophy into a view the very opposite of that of the ancient heathens respecting matter. Those of them who considered the soul as an immaterial substance, complained of matter as the dregs of existence, and an incumbrance on their being; but we are led to see infinite space peopled with it, and our earth, which they supposed to comprehend the most of it, is diminished into an almost imperceptible speck in the creation, and yet all teems with the elements of exalted science. What, then, we are led to ask, must be the character of our existence, if we are to enjoy immortality? There must be a congeniality in the nature of our being to the home of these heavens into which we are about to enter. Yes, our souls will be connected with material organs, that we may be enabled to examine and admire the infinite wisdom and knowledge which the boundless material universe will for ever present to our examination, and to feed and maintain, in part, at least, our adoration of the Author of all spiritual and material being. Hence said a presiding officer in an early philosophical society, I know that my Redeemer liveth, and though after my skin, worms destroy this my body, yet in my flesh shall I see God, whom I shall see for myself and mine eyes shall behold and not another.