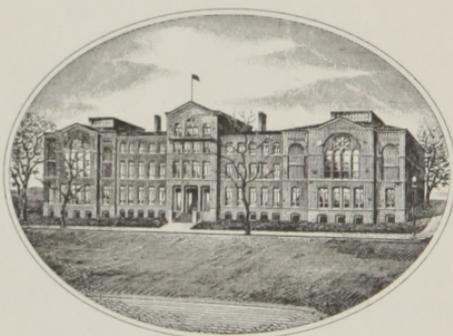


NATIONAL LIBRARY OF MEDICINE
Washington



Founded 1836

U. S. Department of Health, Education, and Welfare

Public Health Service

215
6

AN ADDRESS,

DELIVERED BEFORE THE

COLUMBIAN INSTITUTE,

FOR THE

PROMOTION OF ARTS AND SCIENCES,

AT THE CITY OF WASHINGTON,

ON THE 11TH JANUARY, 1817.

BY EDWARD CUTBUSH, M. D.

Hon. Memb. of the Philadelphia Medical and Chemical Societies;
Corresponding Member of the Linnæan Society of Philadelphia;
And President of the Institute.

PUBLISHED BY THE REQUEST OF THE COLUMBIAN INSTITUTE.

Seaton & Co's
LIBRARY
231506
WASHINGTON:

PRINTED BY GALES AND SEATON.

1817.

THE UNIVERSITY OF CHICAGO

PHYSICS DEPARTMENT

COLLEGE PHYSICS

PROFESSOR OF PHYSICS

IN CHARGE OF THE COURSE

OF PHYSICS

FOR THE YEAR 1900-1901

LECTURES BY

ROBERT A. MILLIKAN

AND

WALTER D. HIGGINS

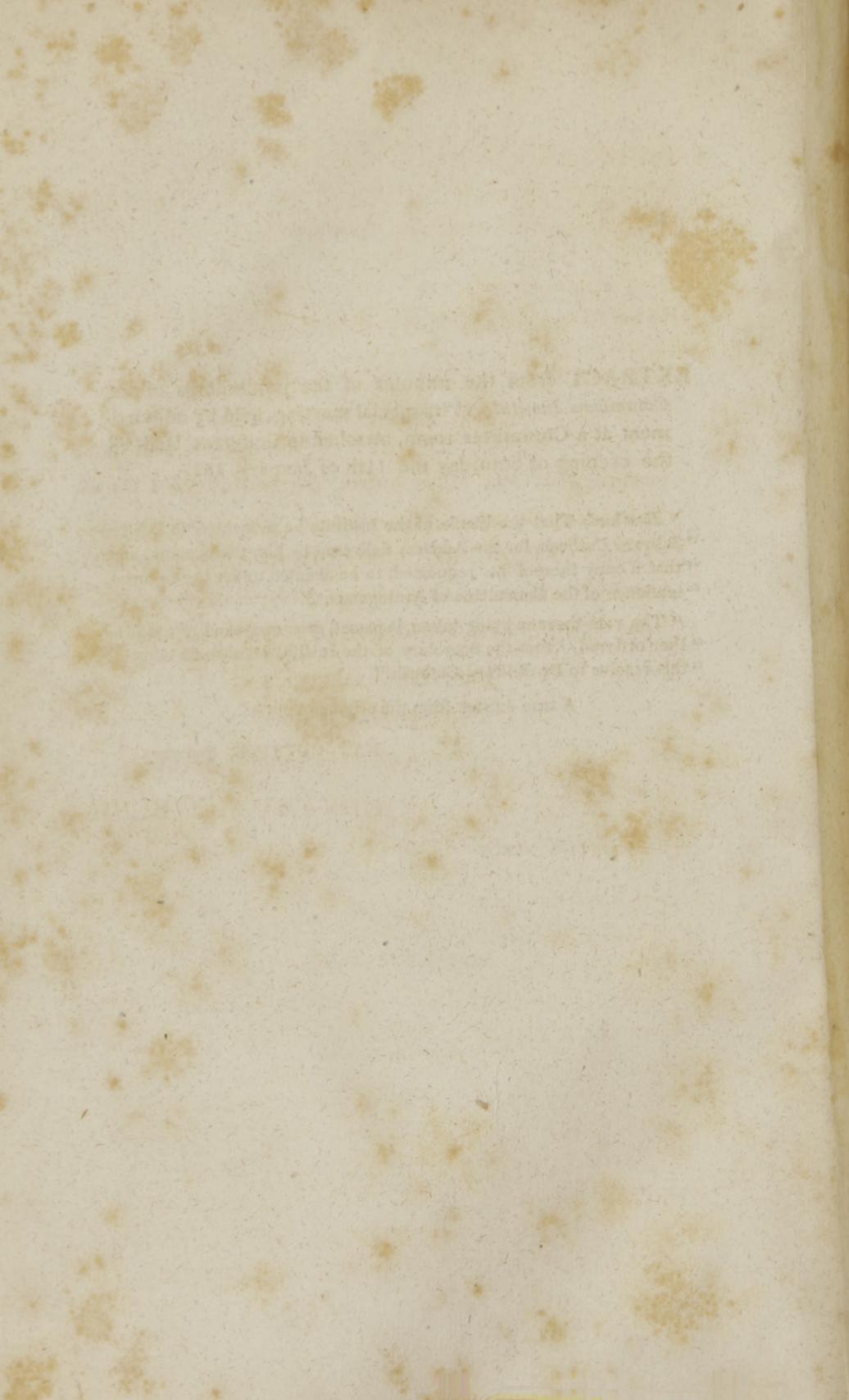
EXTRACT from the minutes of the proceedings of the
Columbian Institute, at its special meeting, held by adjournment at a Committee room, attached to Congress Hall, on the evening of Saturday the 11th of January, 1817.

“ *Resolved*, That the thanks of the Institute be presented to Doctor Edward Cutbush, for the Address delivered by him this evening, and that a copy thereof be requested, to be printed under the superintendence of the Committee of Arrangement.”

“ The vote thereon being taken, it passed *nem. con.*—and it was further ordered, ‘ that the Secretary of the Institute transmit a copy of this resolve to Dr. Edward Cutbush.’”

A true extract from the original minutes.

NAT. CUTTING, *Secretary*.



TO THE PRESIDENT OF THE UNITED STATES:

THE following brief view of the objects and importance of the Association, formed at the City of Washington, under the title of the "COLUMBIAN INSTITUTE, FOR THE PROMOTION OF ARTS AND SCIENCES," which you have been pleased to honor with your PATRONAGE, is respectfully dedicated, by

YOUR EXCELLENCY'S

Most obedient,

And very humble servant,

EDWARD CUTBUSH.

WASHINGTON, JANUARY 13, 1817.

PREFATORY REMARKS.

I PRESENT an outline of the objects and importance of the Columbian Institute, for the promotion of Arts and Sciences.

Having perused various publications on the science of chemistry, and its application to the arts and manufactures, it is probable I have, in the following address, introduced, not only many ideas of their authors, but their language. As those publications are not immediately at my command, to enable me to make a particular reference, I solicit my readers to place to the credit of their authors, whatever may be considered interesting on that branch of my subject.

E. C.

ADDRESS.

*Fellow-Citizens, and
Members of the Columbian Institute :*

I AM NOT insensible of the importance of the duty confided to me at your last meeting, and wish, most sincerely, that a member of more leisure and ability, to do justice to the subject, had been selected : anxious, however, to render my feeble aid towards promoting the objects of the Institute, I solicit your attention, whilst I take a general view of its origin, and of the numerous advantages which may flow therefrom to the community.

To a citizen* of this District, whose philanthropy and public spirit are as unlimited as the fertility of his imagination, we are indebted for the first suggestion of the importance of such an association at the seat of government.

We have, after several meetings, made some progress in the arduous undertaking, and have adopted a constitution, subject to such amendments as your wisdom and experience may hereafter dictate. The objects embraced by the Institute are,

“To *collect, cultivate, and distribute*, the various vegetable productions of this and other countries, whether medicinal or esculent ; or for the promotion of arts and manufactures :

* Thomas Law, Esq.

“To collect and examine the various mineral productions and natural curiosities of the United States, and to give publicity to every discovery that the Institute may have been enabled to make :

“To obtain information respecting the mineral waters of the United States, their locality, analysis, and utility, together with such topographical remarks, as may aid valetudinarians :

“To invite communications on agricultural subjects, on the management of stock, their diseases, and the remedies.

“To form a topographical and statistical history of the different districts of the United States ; noticing particularly the number and extent of streams ; how far navigable ; the agricultural products ; the imports and exports ; the value of lands ; the climate ; the state of the thermometer and barometer ; the diseases which prevail in the different seasons ; the state of the arts and manufactures ; and any other information which may be deemed of general utility.

“To publish, annually, or whenever the Institute shall have become possessed of a sufficient stock of important information, such communications as may be of public utility ; and to give the earliest information, in the public papers, of all discoveries that may have been made by, or communicated to, the Institute.”

Thus, gentlemen, you are presented with an ample field for the exercise of your talents and industry ; difficulties, I am sensible, will occur ; but were there no difficulties to encounter, less would be the space for the expansion of your genius. It is true, that in the infantile state of our city, we cannot boast of the possession of many, whose avocations have permitted them to devote their time to the cultivation

of the sciences ; but we can, with confidence, assert, that there are many, very many, who possess industry and an ardent desire to promote the objects of the Institute ; whose minds, when allured to the contemplation of those objects, aided by a *botanical garden*, a *mineralogical cabinet*, a *museum for the reception of natural curiosities*, and a well selected *library*, will, in a short period, be enabled to render essential services, in many of the branches of knowledge embraced by our constitution. In the mean time, I trust, that the members who have been selected to execute the important duties required of the General Committee, will, by their *talents*, *industry*, and *perseverance*, render the establishment worthy of the District of Columbia ; and, by their example, will stimulate others to devote their time and talents to the promotion of the laudable undertaking : thus, by an accession of talent, “growing with its growth, and strengthening with its strength,” we may look forward, with pleasure, to the period, when the Columbian Institute, for the promotion of Arts and Sciences, will assume an elevated rank amongst the scientific associations of our country.

From the union of industrious men, the arts find resources, which can never be met with in the labors of individuals, with whom the most useful discoveries are frequently buried. Societies form, as it were, magazines, in which are collected the knowledge and discoveries of the learned in all parts of the world, and consecrate them to public utility ; they form a commerce for the community, and, from age to age, will, *if supported*, be a fruitful source of acquisitions and benefits to the country. Thus, in our Institute, as in a pure and fertile climate, talents of different kinds may spring up and unfold them-

selves ; which, if properly applied, may cause the liberal arts and sciences to flourish ; and how pleasing is the reflection, that many, probably, whom I have now the honor to address, may be instrumental in giving a proper direction to the labors of the *agriculturist*, the *artist*, and the *manufacturer*: pardon me, if I presume to extend the importance of this Institute still further, even, if *properly* conducted, to the advancement of the literary character of our country.

Every enlightened citizen should be interested in the examination of the natural productions of his country. The United States offer rich mines of knowledge yet unexplored ; the woods, the waters, and the bowels of the earth, court an examination ; by the aid of the Institute, new objects may be discovered, which may not only be advantageous to the artist, agriculturist, and manufacturer, but to the nation at large.

The extensive limits of our country afford numerous opportunities for discoveries and improvements, in every branch of natural science. How many plants are there, natives of our soil, possessed of peculiar virtues, which would supersede the necessity of importing those that are medicinal, or necessary for the operations of the dyer ! How many minerals which might serve, not only to enrich the cabinets of the curious, but minister to the wants of our growing population ! What an infinite number of substances may present themselves as objects of new trade and commerce, or for the supply of the necessary materials, for the various domestic arts and manufactures ; and what means are so likely to bring them to our knowledge, as research and careful investigation ? Therefore, considering the extent of

territory embraced by the United States, whose surface and internal structure have scarcely been examined, it must be regarded as a national reproach, that we are still unacquainted with the important sources of wealth, which are yet to be opened by chemical and mineralogical enterprize. Every individual of our republic should be animated with a patriotic zeal in this important undertaking.

We have been peculiarly fortunate, my friends, that our association has commenced at the Seat of Government; where, through the representatives of the people, coming from the various sections of our country, of different climates and soils, whose minds are illuminated by the rays of science; and through the scientific citizens and foreigners who visit this metropolis, we may reasonably expect, not only valuable communications, but various seeds and plants; hence, the necessity for a *botanical garden*, where they may be cultivated, and, as they multiply, distributed to other parts of the Union. Arrangements should likewise be made to establish a museum, in which the natural curiosities may be deposited, and the minerals, which may have been presented, scientifically arranged, noticing particularly their locality; and the public should receive the earliest information on such as may appear of utility, in the various arts and manufactures. The numerous grasses, grains, medicinal plants, trees, &c. which are not indigenous to our country, should be carefully collected, cultivated, and distributed to the agriculturists.

It is with pleasure I have read, in our public papers, that the coffee plant has been introduced into the southern sections of our country, and is likely to flourish. We already enjoy the result of

the industry and patriotic exertions of our citizens, who have successfully introduced the culture of the *Arundo Saccharifera*, from which the United States, in a short period, will be amply supplied with sugar, which, at present, forms so important an article in our diet.

The immense quantities of cotton raised for exportation and the use of our manufactories, shew the enterprize of the planters. The growth and manufacture of this necessary article ought to be encouraged by every citizen, who feels a desire that his country may not be tributary to Europe, for the clothing of her population; it is a remarkable fact, that, in the year 1787, not a bale of *cotton* was raised in the southern states, for exportation.

Various dyeing drugs might be cultivated to great advantage. Though the color of cloth is not essential, yet custom has made it necessary for the manufacturer to please the eye; it is, therefore, desirable that such dyeing drugs only should be used, which our country furnishes, or that foreign dye-stuffs should be cultivated in our country. *Madder*, *Rubia tinctorum*, and the important coloring plant called woad, *Isatis tinctoria*, might be cultivated in many of our soils, and our oak, and other barks, are of immense importance as dye-stuffs, which, by the aid of chemistry, may be made to produce various tints. The bark of the *quercus nigra*, to which the name of *quercitron* has been given, has, for many years, been exported from this country to Europe, to supply their dye-houses, and for the application of this bark to the process of dyeing, Dr. Bancroft, of England, enjoyed the exclusive privilege of its importation.

From a series of experiments made by Dr. Seybert, of Philadelphia, I conceive that our common pokeberry, *Phytolacca*, would be worthy of cultivation, and, by proper management, would rival the Tyrian purple. The coloring matter might be inspissated for transportation. The cochineal insect, used for dyeing scarlet, may, with attention, be propagated in every part of our southern climate, where the Indian fig, *Cactus opuntia*, flourishes. Italy is indebted for a great portion of her annual wealth to two Persian monks, who brought a few eggs of the silk-worm from China to Constantinople, *concealed* in the hollow of a cane, from whence they were propagated. Before this period, anno 553, raw silk from the east sold in Rome for its weight in gold. Perhaps the time is not far distant, when the United States will enjoy similar advantages, from many of the articles which I have enumerated.

The cultivation of indigenious and exotic plants, capable of manufacture, presents an important object to the agriculturist. The culture of the vine, a new and highly valuable branch of agriculture, ought to be encouraged. The commanders of our national vessels would, I am confident, procure for the Institute the various species of vines from the Mediterranean; and, from my knowledge of their disposition to render, in all cases, *essential* services to their country, they would, if requested, procure, likewise, various seeds, plants, and minerals, from the different ports they may visit. They have exposed their lives, in defence of their country's rights, on the boisterous ocean, and none would feel greater pleasure than they, in promoting her *internal* prosperity and happiness.

Even the cultivation of our common sun-flower, *Helianthus*, and the white poppy, *Papaver somniferum*, next to the olive, would be highly important; the seeds of these plants yield a bland oil, suitable not only for domestic purposes, but for the use of the artist and manufacturer. Should we be enabled to introduce a single grain, or one grass, which will afford a greater proportion of nutriment than those we now possess, millions may be produced to our country.

To enumerate the various articles which might be cultivated and distributed, would extend my remarks far beyond the limits of an address. By establishing a botanical garden, we may not only receive instruction ourselves, but excite a spirit of inquiry in the minds of the rising generation; every parent within the District of Columbia, who is desirous of seeing his children possessed of general information, should contribute towards the establishment and support of the *garden, museum, and library*. By the science of botany, we learn to methodize the vegetable part of the creation, and to arrange it into different classes, orders, genera, and species: by this systematic arrangement, we are taught, that all plants, of the same natural order, are endowed, in a degree, with some common virtue. What pursuit can be more rational or amusing, than the cultivation of that science, which leads the inquisitive mind to an acquaintance with the works of nature? She presents to you an extensive and sublime scene; she allures you to a knowledge of her works, not only through this science, but through those of chemistry and natural history; in these she also presents to you various objects, suited to your different tastes and dispositions: each will afford an

ample scope for the exercise of your minds in retirement, an abundant source of knowledge, and much rational amusement ; and will enable you to benefit the community, by imparting to others the information you may acquire. Whether you direct your attention to the mineral productions of our soil ; to the various diminutive shrubs and flowers which grace the banks of the meandering rivulets ; to the tribes of variegated insects, which riot in the sun-shine of pleasure ; or to the majestic forest tree, whose towering branches penetrate the portentous cloud ; you are presented with a sublime scene for contemplation and minute investigation. To Dr. Benjamin Smith Barton, deceased, late professor of botany and natural history in the university of Pennsylvania, our country is highly indebted for that spirit of enquiry, which has been excited throughout the United States, on this important branch of science, by which many valuable indigenous plants have been added to the *materia medica* : and, I trust that the time is not far distant, when we shall be enabled, with certainty, to say, "*ubi morbus est, ibi remedium.*" In short, my friends, there is scarcely an art, science, or manufacture, which may not be benefitted by this association ; and should we be so fortunate as to succeed in establishing a botanical garden, it may excite an emulation among the proprietors of the eminences around our city, by inducing them to cultivate and adorn those beautiful heights with gardens : no city in the United States presents a greater assemblage of sublime views : nothing is wanting but *industry*, *public spirit*, and *population*, to render them not only pleasing to the eye, but highly advantageous to this district ; and, I am confident that the ladies*

* Ladies were invited to hear the Address.

of this city, from whose taste and judgment, I presume, there will be no appeal, will concur with me in the importance of a *botanical garden*; which will not only embellish the metropolis, but afford a delightful retreat, where they may inhale the fragrant breeze, contemplate the beauties of the creation, and elevate their minds from the works of "nature to nature's God."

The following lines, from the pen of a gentleman of this city, are so applicable to the proposed botanical garden, that I trust he will pardon their recital:

" Oh! think what pleasure Nature's charms impart,
 To draw from worldly cares the human heart;
 What glowings flush, with exercise, the cheek;
 What inward bliss the roseate tints bespeak.
 The mother *there*, may with her boy, repair,
 T' inhale the fragrance of balsamic air:
 What joy! beneath the shade, to view her child
 Ply his elastic limbs, in gambols wild;
 She on his future prospects fondly bent;
 He on his momentary sports intent.
 The statesman *there*, may turn th' historic page,
 And learn experience from each former age.
 The poet *there*, may court his muse retir'd,
 And, tracing vivid scenes, become inspir'd.
 The lover *there*, may wander in the grove,
 Indulging all the doubts of timid love;
 Or stretch'd along the willow's roots, complain
 Of slighted vows, in many a weeping strain.
There, youths and nymphs, conversing arm and arm,
 May, wandering, feel the soul-expanding charm,
 When both instruction or delight impart,
 With happy interchange, from mind and heart:
 Or, seated in some shady blest retreat,
 Mingle with soft discourse their glances sweet.
 What bliss, to view the flow'rs, the shrubs, and trees,
 And hear the murmur'ring rill, and whisp'ring breeze.
 What harmony! when birds in song unite,
 Nestling and billing, fluttering with delight.
 Lives there a man, whose bosom does not glow
 With prayers to Him, from whence these blessings flow?
 All eyes, all hearts, a garden must approve,
 'Twas Heav'n's first gift to innocence and love."

The celebrated Lord Kaimes remarks, "that rough, *uncultivated* ground, dismal to the eye, inspires peevishness and discontent; may not this be one cause of the harsh manners of the savages? A field, richly ornamented, containing beautiful objects of various kinds, displays, in full lustre, the goodness of the Deity, and the ample provision he has made for our happiness. Ought not the spectator to be filled with gratitude to his Maker, and benevolence to his fellow creatures?"

"Other fine arts may be perverted to excite irregular, and even vicious emotions; but, gardening, which inspires the most refined and pure pleasures, cannot fail to promote every good affection. It is not easy to suppress a degree of enthusiasm, when we reflect on the advantages of gardening with respect to virtuous education. The gaiety and harmony of mind it produces, inclining the spectator to communicate his satisfaction to others, and make them as happy as himself, tends naturally to establish in him a habit of humanity and benevolence."

A traveller in Switzerland describes the "fierce manners of the Helvetians, three or four centuries ago, to their being continually inured to war; and observes, that no circumstances tended more to soften their manners, and to make them fond of peace, than the public buildings, carried on by their senate, in ornamenting their CAPITAL."

Having made these *general remarks* on agriculture, horticulture, and architecture, and their influence on society, I pass on to the subject of mineralogy, which is a highly important branch of enquiry. Our country, as I have already stated, so far as it respects her minerals, is unexplored. Of the immense riches which her bosom contains, we are

absolutely ignorant; it should, therefore, be one of the primary objects of the Institute, to procure specimens of all the minerals which have been, or may hereafter be, found in the various districts. Independently of the metals, clays, marbles, &c. which may be found useful to the artists and manufacturers, pigments might be manufactured from many of the ores, equal, if not superior, to those which are imported. Within forty miles of this city, a mineral* is found, which furnishes a pigment that has been sold in Europe at a guinea per ounce. In consequence of this defect of knowledge respecting the minerals of our country, persons have been sent from the borders of Seneca Lake, in the state of New York, and, if I mistake not, from Pittsburg, in the state of Pennsylvania, to a spot in the vicinity of Philadelphia, to procure clay, from whence it was transported, by land and water, from three hundred and twenty to six hundred miles, for the use of their respective glass manufactories, when, doubtless, the same quality of clay could have been found in their vicinity, if the country had been explored.

The mineral, or subterraneous treasures of our country are, next to agriculture, interesting subjects of enquiry; in many places, the riches of the surface are nothing, when compared with those which are concealed in her bosom. What an important discovery would a bed of coal be, in the vicinity of our large cities, where fuel is daily becoming a scarce and extravagant article? And how immensely valuable would sulphate of lime and marl be to planters in the vicinity of *this place*? In fact, agriculture and commerce depend, in a great measure, on mineral treasures. Many persons, who have not

* Chromate of iron.

had an opportunity of consulting works on mineralogy, conceive that minerals, properly so called, are ores, or metallic substances: but all the solid substances of which our globe is composed, are called minerals, and that branch of science which describes and investigates their properties, MINERALOGY; which is usually divided into stones, salts, combustibles, and ores; these again are subdivided into orders and families. It will be highly useful to have a cabinet of such minerals, as have been, or may be, found in our country, properly classed, and, if the funds of the Institute should hereafter permit it, a complete collection of foreign minerals, scientifically arranged for comparison.

Another object, which claims the attention of the Institute, is, to obtain correct information respecting the mineral waters of our country. All waters which are distinguished from common water, by a peculiarity of taste, odour, color, &c. and which, in consequence thereof, cannot be applied to the purposes of domestic economy, have been distinguished by the appellation of mineral waters; but I presume, that the Institute wishes to become acquainted with those only, that have been accurately analysed, and which have been found useful to valetudinarians.

The communications, which may be received on agricultural subjects, on the management of stock, their diseases and the remedies, when promulgated by the Institute, will afford valuable information to the practical farmer.

The sixth article of the first section of our constitution, which embraces topographical and statistical information, contains so many questions, highly interesting to the community, that volumes might be written on their importance. On these, as on

many other branches of knowledge embraced by the Institute, we may expect many learned communications from the enlightened representatives of the people, who annually visit this city.

Finally, the selection and publication of the most valuable papers, which may have been communicated, whether on commerce, agriculture, the arts, sciences, or manufactures, will, I trust, furnish annually a respectable volume of information.

I have now, in a cursory manner, taken a view of the objects and importance of this association; with due deference to the General Committee, I would recommend, that printed circulars be prepared, containing the necessary questions for the information of the Institute, so arranged, and divested of technical terms, that those persons, who have not been engaged in scientific pursuits, may be enabled to comprehend and answer them with promptness. I would also beg leave to suggest to the Institute, the propriety of offering premiums, or some honorary reward, whenever the funds will permit, for important discoveries in agriculture, or the mechanic arts or sciences which may promote it.

As the science of chemistry may be considered a hand-maid to many of the arts, embraced in the objects of this Institute, I solicit your indulgence whilst I offer a few remarks on its utility.

Chemistry has become a new science; it is no longer confined to the laboratory of the arts, but has risen to the most sublime heights of philosophy; it has unfolded many of the mysteries of nature, which have hitherto been regarded as impenetrable, and extended our views of the connections and agents, which constitute growth, life, decay, and final destruction. In connection with the operations of na-

ture and existence of man, this science is worthy of a more general diffusion ; it unfolds the most important phenomena of nature, and teaches us to render the productions of the animal, vegetable, and mineral kingdoms subservient to our use, and enables us to reason on the properties of bodies which most immediately concern us, and to predict their alterations ; it presents to us a sublime view of the order and harmony of the different parts of our system, and displays, in a superlative degree, the wisdom and goodness of our Creator. The facts which chemistry has established, prove that all the different substances belonging to our globe, are subject to invariable chemical laws ; that the most extensive and important mixtures and combinations are continually taking place, not only in the solid substances of the earth, but in the ocean and atmosphere. Berthollet, a celebrated French chemist, has shewn, by experiments, that, whenever the soil becomes charged with vegetable matter, the oxygen of the atmosphere combines with it, and converts it into carbonic acid gas ; and that the same carbon, in process of time, is absorbed by a new race of vegetables, which it clothes with a new foliage, that is destined to undergo similar putrefaction, and renovation to the end of time.

The matters composing the terrestrial mass of the globe we inhabit ; the waters which meander on its surface, or penetrate its recesses ; the more subtle gaseous matter which surrounds it ; the important agents of heat and light, and other imponderable substances expanded through space ; the growth of animals and vegetables, and the production of the different solid and fluid substances of which their bodies are composed, together with their changes and mix-

tures, are all subjects for the investigation of the chemical philosopher. This science is intimately connected with almost every branch of human knowledge: the arts, agriculture, and manufactures, objects embraced in the views of this Institute, and so eminently conducive to the prosperity of nations, would never have arrived at their present state of comparative perfection, without the aid of the philosophical chemist. Dr. Bancroft, in his philosophy of permanent colors, observes, that Mr. Wedgwood, whose ware has been so much admired in this country, in consequence of his application to chemistry, was enabled to procure all the fine diversity of colors, which decorated his pottery, from the oxides of iron. Bleaching, tanning, glass, and porcelain making, the working of metals, and various other arts, are purely chemical; therefore, in proportion as chemistry is cultivated, in the same ratio will the arts flourish. Agriculture can only be improved by the assistance of the chemical philosopher. It is chemistry which explains the phenomena of vegetation, the growth, the maturation, and the death of plants; and to chemistry we must have recourse to remedy the diseases to which they are subject.

Vegetation is a chemical process; it consists in a series of changes of composition, terminating in the formation of certain products. We are already acquainted with the influence of soil, and the action of manures, and we have every reason to suppose, that chemistry will enable us to apply the agents on which the nutrition of vegetables depends, or to regulate those circumstances, which influence the formation of their various products. The experiments of a late French writer, Braconnot, lead to the conclusion, that oxygen and hydrogen, with the assist-

ance of solar light, are the only elementary substances employed in the constitution of the whole universe; and that nature, in her simple progress, works the most diversified effects, by the slightest modifications, in the means she employs. He drew his conclusions, from having sown seeds of various plants in pure river sand, in litharge, which is a semi-vitreous oxyde of lead, in flowers of sulphur, and even among common leaden shot; and in every instance employed nothing more for their nourishment than pure water. The plants throve, and passed through all the usual gradations of growth to perfect maturity. On analysis, he obtained from these vegetables all the materials peculiar to each species, precisely as if they had been cultivated in a natural soil. Be not surprised, my friends, should we see floating gardens on our large rivers.

Were I to enumerate all the important effects resulting from the application of chemistry to agriculture, the arts, and manufactures, I fear, that I should trespass on your patience. I cannot, however, refrain from remarking, that we are indebted to this science for the discovery and application of the *carbureted hydrogen gas* to the illumination of our streets, manufactories, and public buildings; and Pappin's digester, improved by the celebrated Cadet de Vaux, would, in *times of scarcity*, be ranked among the most important discoveries; by it, the bones of animals, which are usually thrown into our streets, might be rendered proper for the food of man. One pound of bone, according to the experiments of this able chemist, yielded twenty-four bowls of excellent soup. Since chemistry has extended our views of the laws of heat, our navigators are enabled to steer clear of sub-marine rocks, of the

massy pyramids of ice which float from the poles, and of the dangerous lee shore, when enveloped in mist, or shrouded by the mantle of night. I can attest the utility of the thermometer as a sea instrument.

The science of chemistry is considered of so much importance in Europe, that it has become an essential branch of education, in most of the public seminaries. In France, professors are appointed to deliver public lectures, at the expense of the nation; *there*, may be seen the philosopher, legislator, minister, naturalist, physician, agriculturist, engineer, artillerist, manufacturer, painter, dyer, in short, every class of citizens, assembled to hear public lectures on this interesting science; and I will venture to affirm, that there is not a single operation among its processes, nor a single discovery in this science, which may not be considered as the source of a new art, or of new advances to be made in some art already established. This science boasts of the patronage of a number of eminent men. Dr. Black, Dr. Home, Dr. Hunter, and Mr. Davy, have all contributed largely towards benefitting the British empire, by the application of their chemical researches to national purposes, particularly to agriculture and manufactures.

Whilst the study of chemical science was confined exclusively to physicians, it was limited in its objects. From the laboratories of private gentlemen, and particularly from Priestley, Lavoisier, and Cavendish, those great discoveries issued, which have exalted chemistry to its present rank and usefulness. It is worthy of remark, that Dr. Priestley did not make a single chemical experiment, until he was in the fortieth year of his age. *What an ani-*

mating example of industry and application! By his important discovery of oxygen gas, called, by him, dephlogisticated air, we were taught how, and why, we respired; without this pabulum vitæ, we should cease to exist. Volumes would not contain an enumeration of the important discoveries he rendered to society; he was, unquestionably, one of the brightest ornaments of pneumatic philosophy. Persecuted in the land of his nativity, he retired to the peaceful shades of Northumberland, in the state of Pennsylvania, where, full of years and covered with literary honors, he departed this life in 1804:

Science still mourns his loss.

Considering the vacant time which the affluent planters, in some parts of our country, possess, it is a matter of astonishment and regret, that the sciences of botany, chemistry, and mineralogy, have not been generally cultivated, either by themselves or their sons, who are to inherit their estates. Botany would enable them to explore the woods; and their leisure hours might be employed in amusing and useful experiments, to ascertain the quality of their soil, the minerals which it imbosoms, and of the waters which flow on its surface, by which they would not only render an essential benefit to their country, but add considerably to their wealth.

On taking a retrospect of the importance of this association, I cannot refrain from indulging the pleasing hope, that the members of our national government, to whom has been confided the guardianship of the District of Columbia, will extend their fostering care to this establishment, and, if no constitutional restrictions forbid it, that a part of the public ground, reserved for national purposes, may be vested in the "Columbian Institute for the pro-

motion of Arts and Sciences," for the purpose of carrying into effect the leading objects of the association; also, that the members, who now, or may hereafter, compose the Institute, may become an incorporated body. I would also, with due deference, suggest, that a small pecuniary aid would enable the Institute, at an earlier period, to extend its benefits to all parts of the United States. I am confident, that the enlightened and patriotic citizens of our country will co-operate in the laudable undertaking, and enable us to render an essential service to the nation, by perpetuating an establishment worthy the metropolis, bearing the name of our *illustrious* WASHINGTON; where, at some future period, the youth of our country will repair to complete their education at the national Seminary, to which the Botanical Garden and Mineralogical Cabinet would be important appendages.

Much may be expected from the rising generation; the various seminaries and societies for the diffusion of knowledge, now enrol the names of many whom our country will delight to honor and reward. Our forests, which, but a few years since, were the haunts of savages and wild beasts, have been decorated by the enterprise of our countrymen with cities and villages, which vie with many on the continent of Europe, and with their increase, *public seminaries multiply*. In no nation has their industry been surpassed; the earth, cultivated by their care, teems yearly with new productions; the proud oak falls at their feet to receive from them a new being; hemp and flax are divested of their bark to furnish clothing; the metals are moulded by their hands; the fleece intended for their use is woven and dyed of various colours; and the golden har-

vest and rich attire of their verdant lawns, attest their industry, their opulence, and increasing importance.

The confines of the patent office, of our city, bear ample testimony of the genius which prevails in all parts of our country. To what are we to attribute this grand spectacle, or what has infused so much strength and activity into the mind, but our republican institutions? We have the superlative happiness to live in tranquillity, under an *inestimable form of government*; here, plenty smiles, and an honorable field is open to the talents and enterprise of every class of citizens. Where genius and talents are respected, rewarded, and promoted, the arts and sciences will flourish, and the wealth and power of the nation increase.

Gentlemen and associates! what more shall I say? Shall I tell you, that by your labors, this picture of happiness and independence may be increased? That, by your humble efforts, you may be instrumental in elevating your country to the highest pinnacle of glory; or, shall I tell you, that the great work in which you are engaged, will enrol your names in the temple of Fame? No—I will not insult your understandings; your intercourse with the world must, long since, have convinced you of the importance of such associations. May your labors be crowned with success.

Med. Hist.

WZ

270

C988a

1817

C.1

