Maryland Academy
of Science and
Literature
Transactions Vol. I

TRANSACTIONS

OF THE

MARYLAND ACADEMY

OF

SCIENCE AND LITERATURE.

VOL. I.

PUBLISHED BY THE ACADEMY.

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1837.

INTRODUCTION.

The first successful efforts to organize an association in Baltimore, for the promotion of science and literature were made in the year 1822. Similar associations had been previously contemplated; some had actually gone into operation, but they soon disappeared after an ephemeral existence. The Maryland Academy of Science and Literature was opened under more favourable auspices. A greater number of persons presented themselves willing to advance by their zeal the objects and the pursuits embraced within the scheme; so that, at already an early stage of its organization, by the spontaneous liberality of some of its members and of other gentlemen, the academy found itself in possession of an extensive collection of minerals, and an herbarium, the nucleus of a cabinet around which new materials might daily accumulate, and without which no association of like character can expect to hold together, nor can in truth be said to have an existence.

A strong appeal was then addressed to gentlemen of the learned professions in the city, and throughout the state, which was in some measure responded to, and the number of contributing members became soon sufficiently large, to justify the step of procuring an apartment, where the meetings of the Academy could be held; furnishing, at the same time a place of safe-keeping for the collection, which was beginning to acquire both extent and interest. Still there remained many difficulties to contend against. The limited pecuniary means at command, forbade the erection, or purchase, of a suitable edifice to be appropriated exclusively to the uses of the Academy. No building of a public nature could accommodate it; and the frequent removals thus occasioned, besides doing much damage to the collection, took away from it that character of permanency, alone capable of rendering it an object of solicitude to the members. At length, however, the collection was removed to a spacious hall, in a public edifice, eligibly situated, where in a short time it increased so as to become worthy the attention of the naturalist.

The principal accession which the property of the academy received at this period, consisted of a library, composed of standard works of reference, procured in part with a sum of money being the accumulated fund of a pre-existing society, which was thus transferred by its surviving members. The Academy stands indebted for this valuable acquisition to its then president, Robert Gilmor, Esq. who contributed besides, individually, by the donation of several costly and useful works. Other presents were also received from various quarters, the whole forming a collection of about eight hundred volumes, of the best publications in the different branches of the natural sciences. In the meanwhile, there was added to the cabinet an extensive series of geological specimens obtained from Germany, together with samples of the mineral formations occuring in this state. And subsequently, a considerable number of shells, recent and fossil, with numerous preserved individuals belonging to other departments of natural history, had been procured, all of which, whilst it gave evidence of zeal on the part of the few active members belonging to the academy, had become an object of interest to the scientific traveller, and proved that the natural sciences were not altogether neglected in Maryland. But in an unfortunate hour nearly the whole of this valuable property was consumed by fire.

Not discouraged by this calamity, the members of the Academy, acting under the authority of a charter obtained in the year 1826, have determined to re-organize their society. Fully persuaded of the intrinsic importance of their scheme, its utility, the character it it may confer upon the city, as well as the general benefit that may accrue to the community by a co-operation of efforts to promote its accomplishment, they have set to work earnestly, not only to restore the Academy to what it was after twelve years of existence, but to re-establish it upon a basis of permanent prosperity. It is with infinite pleasure, therefore, that they find it in their power to announce, that in the short space of one year since its revival, having obtained a commodious set of apartments comprising one of large dimensions, the number of their collaborators having also greatly increased, their library already equals in extent, and surpasses in interest, that which they have lost, whilst the cabinet contains several thousand zoological, botanical, and mineralogical specimens. Every week brings new accessions to both; so that, at this time the rooms of the Academy afford to the student of nature a place of resort, where he may pursue his favourite study with gratification as well as improvement.

It is not the intention of the Academy, however, to confine its operations solely to the collection of natural objects. The members desire to extend its sphere of usefulness; by submitting to the learned their intellectual labours, that have heretofore been compelled to seek a channel of publicity through scientific journals at a distance. It is now proposed to publish from time to time, a volume, or part of a volume of Transactions, which will embody detailed accounts of the peculiarities in the natural history of Maryland, new investigations in the physical sciences, and original essays on subjects of general interest connected with them. An additional incentive to exertions will in this way be offered to the members; and, it is hoped, that the learned world will consent to accept the offering as an earnest of what is contemplated to be performed.

To regulate as well as to facilitate the operations of the Academy the members have arranged themselves into sections, to which all donations according to their kind are referred, and are reported upon at the time, or at a succeeding meeting, by the chairman, or any other member to whom the subject may by him have been committed. The sections are denominated as follows:

Section 1.—Mathematics, Astronomy, and Physics, embracing Natural Philosophy and Mechanics.—Chairman, L. BRANTZ.

Section 2.—Chemistry.—Chairman, J. T. DUCATEL.

Section 3.—Mineralogy and Geology, including Physical Geography, and the history and classification of Fossil remains —Chairman, P. T. TYSON.

Section 4.—Zoology, embracing the comparative anatomy and physiology of animals—and further divided into six classes, viz: on the history and classification of Mammalia—Birds—Reptiles—Fishes—Insects, and Mollusca.—Chairman, R. E. GRIFFITH.

Section 5.—Botany, including Vegetable Physiology. Chairman, W. E. A. AIKIN.

In this state of things, a renewed appeal is confidently made to the American public, to similar institutions in this and other countries, and to the lovers of nature all over the world, to aid in furthering the objects of the Academy by contributing whatever they may have to spare in books, specimens of natural history, and other objects of interest. As announced in a previous circular, 'the collections which the academy seeks to make, embrace all that can claim the attention of the literary and scientific. They include minerals, shells, fossils, specimens in natural science, books, coins, aboriginal antiquities, maps and documents illustrative of the history, geography, or literature of any portion of the world, and in particular of Maryland. Unpublished barometrical or thermometrical observations—descriptions of celestial or terrestrial phenomena and state statistics which have never been given to the world, are likewise among the means of information which it seeks to gather and make useful.' The academy addresses itself especially to its corresponding members, soliciting their aid in furnishing matter for the pages of its Transactions, to the accurate publication of which the most scrupulous attention will be given.

Subjoined is a list of the present officers, and of the resident, honorary and corresponding members of the academy.

OFFICERS ELECTED JANUARY, 1837.

President,
JULIUS T. DUCATEL.

Vice-Presidents,
PHILIP T. TYSON,
R. EGLESFELD GRIFFITH.

Secretary,
WILLIAM R. FISHER.

Treasurer,
DAVID KEENER.

Librarian,
J. H. QUINBY.

Curators,
JAMES GREEN,
J. H. ALEXANDER,
WM. EDWD. COALE,
WM. RILEY.

RESIDENT MEMBERS.

Names.	When elected.
P. Macaulay,	1821.—May 10.
J. T. Ducatel,	do.
Geo. Frick,	do.
Joshua I. Cohen,	1822.—June 1.
R. Gilmor,	November 2.
David Keener,	December 7.
Philip T. Tyson,	do.
Edw'd Dennison,	1823.—December 2.
I. Tyson, Jr.	1824.—February 24.
J. Pennington,	April 20.
George S. Gibson,	September 30.
Charles F. Mayer,	1826.—January 19.
Jos. W. Patterson,	February 2.
Geo. S. Sproston,	do.
Wm. Gwynn,	do.
Rich'd S. Steuart,	February 16.
J. I. Cohen, Jr.	do.
Charles Tiernan,	March 2.
T. Edmondson, Jr.	1828.—November 27.
Geo. H. Calvert,	1829.—August 4.
Geo. W. Andrews,	1830.—January 21.
H. Willis Baxley,	1832.—January 12.
A. B. Cleveland,	November 1.
J. H. Alexander,	1833.—March 28.
John P. Kennedy,	September 12.
J. H. B. Latrobe,	do.
J. Mason Campbell,	November 28.
Rev. Hector Humphreys, D. D.	do.
Wm. N. Baker,	1834.—September 12.
Wm. R. Fisher,	1835.—February 12.
Benjn. H. Latrobe,	April 16.
John R. W. Dunbar,	1836.—January 1.
Wm. E. A. Aikin,	do.
Lewis Brantz,	January 28.
Theodore Jenkins,	do.
James Green,	do.
Rich'd Wilmot Hall,	February 11.
Nathan R. Smith,	do.
John R. Hazlehurst,	do.
John B. Fitzgerald,	February 18.
Isaac Trimble,	do
J. H. Quinby,	do.

Names.	When elected.
Rich'd Caton,	1836.—March 3.
John L. Webster,	do.
Wm. G. Thomas,	do.
Rev. John J. Chanche,	April 7.
Wm. Riley,	do.
Wm. Ed. Coale,	do.
Wm. Minifie,	do.
R. Eglesfeld Griffith,	November 3.
Cornelius McLean,	do.
John Fonerden,	do.
F. H. Davidge,	1837.—January 19.
F. Chatard,	do.
Rev. John G. Morris,	February 2.
Samuel Annan,	do.
Samuel G. Baker,	do.
Rev. Geo. W. Burnap,	February 9.
John Prentiss,	do.
Thomas Buckler,	do.
Ramsay McHenry,	March 16.
J. Hanson Thomas,	April 6.
Alex. C. Robinson,	do.
J. C. Richards,	do.
R. S. Harlan,	April 13.
P. Rogers Hoffman,	do.
Wm. Geo. Read,	May 10.
Charles Bell Gibson,	August 25.

CORRESPONDING MEMBERS.

Names.	Residence.
James E. Dekay, M. D.	New York.
John E. Holbrook, M. D.	Charleston, S. C.
Lardner Vanuxem,	Bristol, Pa.
Wm. H. Keating,	Philadelphia.
Gerard Troost, M. D.	Nashville.
Christopher Hughes, Esq.	
Charles L. Bonaparte, Prince of Musignano.	Rome.
Wm. Darlington, M. D.	West Chester, Pa.
Gen'l J. G. Swift,	New York.
Edmund Ravenel,	Charleston.
Elias Durand,	Philadelphia.
Lt. Col. S. H. Long,	U. S. Army.
Mifflin Coulter, M. D.	U. S. Navy.

Names.	Residence.
Leonard Osborne, M. D.	U. S. Navy.
Edw'd H. Worral, M D.	U. S. Army.
W. H. Davidson. M. D.	Winchester, Va.
I. Bruce, Esq.	do.
D. H. Barton, Esq.	do.
J. W. Greetham, M. D.	Mount Vernon, Ill.
J. Orville Taylor, Esq.	New York.
A. Sidney Doane, M. D.	do.
Amos Binney, M. D.	Boston.
Charles J. Latrobe, Esq.	England.
Mendes I. Cohen, Esq.	
O. Hill, M. D.	Lewiston, N. Y.
Charles Short, Esq.	Lexington, Kentucky.
John L. Riddell, M. D.	Cincinnati, Ohio.
James E. Heath, Esq.	Richmond, Va.
Philip Williams, Jr. Esq.	Winchester, Va.
Charles B. Shaw, Esq.	Richmond, Va.
James Herron, Esq.	do.
Thomas Pennie, Esq.	Florida.
Z. Pitcher, M. D.	U. S. Army.
Charles Cramer, Esq.	New York.
Rev. John Backman,	Charleston, S. C.
G. W. Clinton, Esq.	Canandaigua, N. Y.
H. A. Schrœder, Esq.	Mobile,
W. L. Hawkins, M. D.	Annapolis.
Cons. I. I. de Macedo,	Lisbon, Portugal.
Prof. Jameson,	Quito, S. America.
L. R. Gibbs, M. D.	Charleston.
Rev. Virgil H. Barber,	Conowingo, Pa.
Matthew Carey, Esq.	Philadelphia.
James C. Palmer, M. D.	U. S. Navy
L. C. Gale, M. D.	New York.
H. P. Sartwell, M. D.	Pen Yan, N. Y.
B. D. Green, M. D.	Boston.
Copley Green, M. D.	do.
Harris, M. D.	do.
Charles Lukin, Esq.	Guayquil.
J. Romeyn Beck, M. D.	Albany.
M. Henry Webster,	do.
Wm. H. May, M. D.	Palmyra, N. Y.
J. Trowbridge, M. D.	Buffalo, N. Y.
James Sullivan, Esq.	Pembroke, N. Hampshire.
Prof. C. D. Cleveland,	Philadelphia.
Prof. James Hall,	Troy, N. Y.
Prof. E. Adams,	Dartmouth College.
Henry Prentiss, M. D.	Gloucester, Mass.
James Renwick, LL. D.	New York.

Names.	Residence.
Lieut. M. G. L. Clairborne,	U. S. Navy.
Lieut. A. K. Long,	do.
S. T. Laurason, M. D.	do.
G. Von Dem Busch, M. D.	Bremen.
Signor Vitore Pecchioli	Pisa.
I. R. Jackson, Esq.	Philadelphia.
James B. Rogers, M. D. *	Cincinnati.
E. Geddings, M. D.*	Charleston.
B. M. Byrne, M. D.*	U. S. Army.
Robley Dunglison, M. D.*	Philadelphia.
T. Phillips Allen,*	North Carolina.
Frederick Hall,	Washington.
Thomas P. Jones,	do.
Dr. Hornbeck,	St. Thomas.
I. Pearson Smith,	South Carolina.
Willis Buel,	Zanesville.

HONORARY MEMBERS.

José Silvestre Rebello, Chargé d'affaires,	Brazil.
Right Rev. Bishop England,	Charleston, S. Carolina.
Thomas Cooper, M. D. LL. D.	Columbia, do.
Benj. Silliman, M D. LL. D.	New Haven, Con.
William Maclure, Esq.	Philadelphia,
Peter S. Duponceau, Esq. LL. D.	do.
John K. Mitchell, M. D.	do.
J. N. Nicolet,	Royal Observatory, Paris.
Baron de Roenné, Minister resident, of the king of Prussia,	Washington.
Don Ramon della Sagra,	Madrid, Spain.
F. R. Hassler,	Washington.
Sir N. Carlyle,	London.
Com. De Figanière, Chargé d'affaires of the Queen of Portugal,	Baltimore.
John J. Audubon,	

* Formerly resident members.

TRANSACTIONS

OF THE

MARYLAND ACADEMY OF SCIENCE

AND LITERATURE.

CLASS OF THE SCIENCES.

ARTICLE I.

Biographical notice of L. H. Girardin, LL. D. *first President of the Maryland Academy of Science and Literature.*

Louis Francois Picot, born in 1771, near Dreux, in the former province of Normandy, France, was educated at the Lyceum of Rouen. He is represented to have been, even at a very early age remarkably fond of books, and was afterwards noticed for his assiduous application to study. He has been heard to say himself, on those occasions when self-praise is not to be suspected, that he was considered by his teachers, who were pleased to encourage him by this avowal, as the best Latin scholar and poet of his class. On leaving the Lyceum he repaired to Paris at the invitation of M. Philippon de la Madeleine, by whom he was liberally patronized. There he became acquainted with most of the literary personages of the day, particularly with the celebrated author of Paul and Virginia, and with the Abbé Barthelemy, the equally renowned author of the Travels of Anacharsis. To the former, young Picot dedicated his first offering to the Muses, which, together with a translation in verse of Goldsmith's Deserted Village, was published, at the request of Bernardin de St. Pierre, by

Didot, of Paris. He likewise appeared as the translator of some pieces from the Italian of Casti, author of the '*Animali Parlanti*.'

But, although these first effusions seem to have received the decided approbation of the public, and to have passed unhurt through the severe ordeal of literary criticism, his friends did not advise him to continue his pursuit after fame in this career. M. de la Madeleine had promised to obtain for him the situation of librarian to the king; and by Bernardin de St. Pierre he was strongly recommended to direct his researches into history, the latter always terminating their conversations together by advising him to write history, and referring him, as a model, to the ingenuous translation of the Lives of Plutarch, by Amiot.

In this apparently unobstructed way towards honours as well as emoluments, M. Picot was however suddenly arrested by the breaking out of the French revolution. M. de la Madeleine his fast friend and patron, being attached to the royal cause, lost his influence, and with it all means of continuing any efficient favours to his protégé. M. Picot then returned to Rouen, and his opinions on the affairs of the time, being, as with the great majority of the enlightened population of France, in favour of a constitutional king, he took in their defence an active part in the editorial columns of the '*Journal de la Seine inférieure*.' He was, in consequence, soon arraigned before a revolutionary tribunal, to answer for some reflections contained in them, upon the execution of the king—an event that had then just taken place. These reflections, dictated by a noble and independent mind, did not suit the captious liberalism of the horde of venal politicians who had already commenced their abominable excesses, and he was compelled to abandon Rouen, whence he retired to his native village, on the eve of submitting to the public, what appears to have been, in his own estimation, his best claim to a literary renown—a tragedy in French verse, entitled Leonidas.

At this time, the horror which filled every bosom throughout France, on hearing of the king's death, had inspired many persons, particularly among the younger part of the community, with a desire to avenge the honour of their country, by rescuing from the hands of a tyrannical faction, the sceptre which it had usurped, and was wielding with so much oppression. But such was the consternation spread throughout the country, such the distracted condition in the affairs of every one, and the anxiety for personal safety, that there could be but little hope of devising any effectual mode of redress. The party of the *Girondins*, oppressed by the Chabots, Marats, and Collot d'Herbois, was soon overpowered and fled. At this time also, the Marquis de Puisaye arrived at Caen, with a small reinforcement from England to General Wimpfen, who commanded the department of Calvados. This individual, who was a pure royalist, probably more attached to the cause of Great Britain than desirous of serving his own country, had, by his insulting and ironical deportment greatly displeased the fugitive Girondins; yet he succeeded in collecting a band of three or four thousand men, at whose head he marched on to the attack of Paris. It was in this little army that M. Picot enlisted himself, no doubt with the most laudable motives; but the fate of this handful of young enthusiasts is well known—a detachment of *gens-d'armes* soon put it to flight. The most obnoxious among them were consequently obliged to seek safety beyond their native shores. M. Picot, being one of them, fled in disguise to Brest, in company with his friend the now much admired poet Du Paty, where he embarked on board of a national ship that shortly afterwards arrived in Hampton roads.

Unable to serve his country, and unwilling to connect his name with the melancholy events of those days, M. P. deserted his employment on the vessel that bore him to America. A French gentleman, who was the proprietor of a small farm in this State received him as a labourer—the present Marquis de Cairon, who had fled with him, being entrusted with the care of the poultry and swine. Then it was that M. Picot, from a false impression that the tyrants of his country could pursue him to this, changed his name to that of Lewis Hue Girardin. As he already possessed a competent knowledge of the English language, he was advised to open a school, and in that capacity endeavoured to render himself useful to those who had extended to him their hospitality. Mr. Girardin's exemplary resignation, the moral courage which he evinced in thus accommodating himself to his reverse of fortune, together with the extent of his information, attracted the notice of some well educated and intelligent gentlemen, and he was soon after invited to become a teacher in the college of Georgetown, D. C. on the recommendation of our late venerable fellow-citizen, John Carroll, Archbishop of Baltimore. Such was that pious Prelate's esteem of Mr. Girardin's talents and virtues, testified to, moreover, in a letter which was gratefully and reverentially preserved by our deceased friend, that he strongly intreated him to receive orders: but it seems that this was not his vocation. He remained sometime a teacher in the catholic college of Georgetown, whence he removed to Virginia, where he presided at different times over several academies, enjoying the esteem and confidence of the first families of that State, whose children were placed under his charge. His character of a public teacher becoming now better known, and more generally appreciated, he received the appointment to a professorship in the university of William and Mary. It is from this place that he began to aspire to the literary standing in his adopted country, which the disasters of a revolution had snatched from him in his native land. He commenced the publication, in conjunction with a German artist by the name of Bossler, of a work entitled *Amœnitates Graphicæ*, to be edited in French and English, the prospectus of which sets forth that it has for its object, 'to form an instructive and amusing collection of views, drawings of animals, plants, flowers, fruits, minerals, antiquities, costumes and other interesting objects; selected with care and engraved upon drawings from nature, or the best representations of those objects; with descriptions and suitable explanations in English and French: the whole with a view of inspiring young people of both sexes with a taste for useful and agreeable knowledge, to facilitate to them the study of it, and to enable them to become acquainted with the languages in which the descriptions and explanations are made. The descriptions and explanations by L. H. Girardin, professor of modern languages, history and geography in the college of William and Mary—the engravings by Frederick Bossler, Williamsburg, September 12, 1804.' This work was not continued, owing it has been understood to some disappointment on the part of the engraver.

In 1805, Mr. Girardin commenced the translation of the Revolutionary Annals, or History of the French Revolution, upon the original manuscript of his friend, likewise a refugee to this country, M. Jean Henri de Croiseuil. This labour also remained unfinished. To the fifth part, which comprises the time when Buonaparte ascended the political horizon together with the first three years of his consulate, there is affixed an introduction by Mr. Girardin: it speaks in his favour, both as a writer and a politician. About this time also, he published his Latin poem *De Monomachia*, which did him credit as a moralist and as a votary to the Muses. In the eighth and twelfth numbers of the Old Bachelor, there are two letters by him, signed T. Lovetruth, that afford elegant specimens of his elevated tone of thinking, and of his sound ideas on the subject of education. Mr. Wirt has given the following testimony to their worth. 'As I read his letter,' he says, 'I felt in the style of his thinking the percussion of genius and virtue; and I am convinced that literature and science stand at their back. *Ex pede Herculem.* He should feel himself, bound to come forth for the good of our common country.' Of his second communication it is observed further; 'Here follows a letter from one, to whom he feels well assured that he will never have to propose either condition or qualification: it is from his first correspondent and fast friend Lovetruth. Even the sorrows and tears of my old friend are full of virtue and instruction. He is a pen,

'To wake the soul by tender strokes of art,
To raise the genius and to mend the heart.''

In the 'Virginia Argus,' Mr. Girardin likewise published a series of literary and moral essays under the title of the 'Philanthropist,' furnishing fresh evidence of the extent and versatility of his talents. The character of 'truth and decency, united to sound principles,' bestowed by a cotemporary upon the columns of the Richmond Enquirer, was acquired whilst Mr. G. was its joint proprietor and sole editor. About this time also he wrote a life of John Adams, at the solicitation of the classical Dennie, which was published in the Port Folio.

But we have now arrived at the period of Mr. Girardin's life, when to our admiration of his talents we are called upon to add our warmest sympathies in behalf of his misfortunes. The dreadful and too memorable catastrophe, which, in December, of the year 1811, plunged the metropolis of Virginia into the deepest affliction, bore upon him most severely. In the conflagration of the theatre, at Richmond, he lost his wife and only son. So great a calamity on a man of ordinary sensibilities weighs indeed heavily enough; but to one, whose feelings are alive to the thousand impressions that pass unperceived by vulgar minds, how tremendous the thought of domestic happiness thus arrested in the full tide of its prosperity! How heart-rending the certainty, that what must ever be the dearest object of parental solicitude, has thus been violently destroyed in its very bud! It requires more philosophy than learning can bestow, to remain erect under so severe a shock. He sunk under its weight; his health rapidly declined; he was forced to suspend his professional exertions, and retired to the upper part of Virginia in quest of health and repose, neither of which he afterwards perfectly regained. The anniversary of this calamitous event was, to the last year of his existence, held by him in melancholy remembrance. He refused at such times to accept of any friendly invitations, keeping himself in perfect seclusion. Yet, in this shattered state of both body and mind, he undertook and completed his continuation of 'Burke's History of Virginia,' one volume of which only has been published. Of the distinguished merit of this performance we have the guarantee of Thomas Jefferson, as well as that of the accomplished author of the life of Patrick Henry. The American Philosophical Society, has also testified to it by electing its author a member of that learned body; and for similar considerations one of the universities of this country, conferred upon him the title of LL. D.

It was with such high recommendations that, invited by the trustees of the Baltimore college and determined by a desire to complete the education of his two daughters in the ornamental branches, Mr. Girardin, came to this city having been unanimously chosen Principal of that institution. Though much engaged in the cares of this seminary of learning, that had been previously and for a long time labouring under serious disadvantages, he did not altogether neglect his literary labours. He is known to have been the author of 'Pulaski Vindicated,'—an energetic pamphlet written in reply to some supposed misrepresentations of the character of that distinguished warrior and patriot, made by Judge Johnson in his life of Gen. Greene. He had also prepared a course of lectures on Botany, for the Agricultural Society of Maryland, but was more particularly engaged at the time he was taken ill, in writing a life of General Lafayette, from documents furnished by the General himself.

It was but shortly after Mr. Girardin's arrival in this city, that proposals to organize a society for promoting the study of the natural sciences were started. To his concurrence in the plan originally suggested, his advice concerning the best manner of putting it into effect, and his subsequent active exertions as its President, the Maryland Academy of Science and Literature owes its existence. It is but a matter of justice, therefore, to record his extensive learning, his accomplishments as a scholar, his urbanity, and the high esteem in which he was held by his associates, on the very first pages that are offered to the public of the Transactions of the Society.

Mr. Girardin's demise took place, whilst he still enjoyed the full vigour of his intellect, and was about to give further proofs of his usefulness in the promotion of science and literature. But we bow with reverence and humility to the dispensations of a Divine Providence; for such were the feelings of our venerated friend when he calmly resigned himself to the will of his Maker, on the 17th day of February, 1825, in the 54th year of his age. J. T. D.

ARTICLE II.

Outlines of the Physical Geography of Maryland, embracing its prominent Geological features. By J. T. Ducatel, State Geologist, &c.

[Read before the Academy, February 16 and March 3, 1837.]

The political boundaries of the state of Maryland, as it is usually represented upon the maps of the Union, are to the N. a straight light running from 1° 1′ E. lon. to 2° 3′ W. of Washington, which separates it from the state of Pennsylvania; to the E. a line nearly at a right angle with the preceding, from the 39° 43′ N. lat. to the 38° 27′ divides it from Delaware, the remaining portion to the 38° being bounded by the ocean; at its south-west extremity it is separated from Virginia, by an east and west line drawn through Watkins' point, whilst its principal southern boundary is determined by the course of the Potomac—assuming the northern branch of the river to be its main branch; and its western limit finally, is formed by a meridian passing through the first fountain of the latter river to the Pennsylvania line; the territory beyond this last boundary being also occupied by the state of Virginia. The space included between these limits presents a surface of 10,000 square miles, of which about 1,200 are covered by the waters of the Chesapeake bay, forming an extent of coast, including the shores of the great tributaries to this inland sea from tide water, of not less than 1,500 miles open to deep water navigation.

The characteristic features of the Chesapeake bay are those of a large arm of the sea, which, measured from its inlet between the capes of Virginia to the mouth of the Susquehanna, is 220 miles in length, with an average breadth of 10 miles, throwing out numberless branches in the form of deep creeks that penetrate far inland, and serving as the estuary to numerous large rivers. Among these, in Maryland, the principal on the Eastern Shore, are the Pocomoke, Nanticoke, Choptank, Chester and Elk, and on the Western Shore, the Susquehanna, Patapsco, Patuxent and Potomac. The limit to which the oceanic tide reaches in them varies. On the

Eastern Shore, where there are no rocky strata to impede its course, it ascends very nearly to their source; whilst on the Western Shore, it is generally arrested by the chain of primary rocks. There is a corresponding limit to the extent of their upward navigation. On the Eastern Shore the rivers are now principally navigated by schooners of one hundred to one hundred and fifty tons burden, and these ascend into the very heart of the country. On the Western Shore, the Susquehanna will float a schooner no higher up than Port Deposite, which is six miles from its mouth at Havre de Grace. Baltimore affords a spacious, deep and remarkably safe harbour, at a distance of twelve miles from the mouth of the Patapsco. The Patuxent is navigable for large vessels thirty miles from the Chesapeake bay, and for the smaller kind forty miles more, and the United States Navy Yard, on the eastern branch of the Potomac, is located one hundred miles up this river. No inland sea of equal extent offers so few impediments to an entirely free and safe navigation, nor so many facilities for an extensive intercourse between the different parts of its shores. In all the tide-water districts of the state, the most remote farmer or planter has seldom over five miles to carry his produce to a commodious landing, which in twenty four to forty-eight hours may reach a large commercial mart. Besides the ease in the navigation over this magnificent sheet of water, arising from the almost total absence of rocks and the fewness of shoals, it is remarkable that the violent equinoctial gales that do so much damage to the shipping in the other ports of the Union nearer the ocean, are seldom felt in this bay, and scarcely ever reach the harbour of Baltimore. The only inconvenience of any consequence to which the bay is liable, arises from the accumulation of ice during a protracted severe winter; but even this has been in a great measure remedied, by the enterprise and ingenuity of the Baltimore merchants and mechanics, in the construction of an effective ice-breaker; so that the intercourse with foreign ports is kept up throughout the whole year. It may be added, that its waters are inhabited by numerous species of fishes, together with testaceous and crustaceous animals, which, whilst adding to the resources of the inhabitants, furnishing the elements of an extensive industry, and extending the commerce of the state, offer subjects of interesting observation, as well as an ample field of discoveries to the naturalist.*

If now we refer to the physical geography of the country on both sides of this great estuary, commencing with its eastern border and proceeding downwards, there is observed a region at no place elevated more than eighty feet above mid-tide, consisting of small sandy hills, at the head of water-courses, or extended levels of stiff clay in the necks and on the bay shore. The appearance which the Eastern Shore exhibits to a traveller who descends the peninsula from north to south by the main road, is therefore far from conveying a just idea of the actual condition of this interesting portion of the state. As the road necessarily passes near the heads of rivers and creeks it crosses over the most sandy and least improved portions of the country. It is in the necks formed by the numerous creeks that intersect the country that the true characters of the soil may be observed; its susceptibility to improvement is as great as in any other portion of the state, and its resources, one of which will be more particularly mentioned hereafter, are numerous. By referring to the map of Maryland and noticing the course of the rivers, it will be seen that there is a general inclination of the country down these necks from

* The largest of the aquatic residents of the Chesapeake bay, at least in the portion of it within the limits of Maryland, are the porpoise *(Delphinus phocæna)* and the sturgeon *(Acipenser brevirostrum*, of Lesueur) although occasionally some of the smaller cetacea venture nearly all the way up in purnit of their prey, during the spawning season of the herring and shad; several individuals of the beluga whale *(Delphinus leucas)* having been caught in the spring of the last year; and on one occasion a seal *(Phoca marinus)* strayed up almost to the head of the bay. But the largest eatable fish brought to the Baltimore market, and decidedly one of the best known, is the rock-fish, *(Labrax lineatus*, of Cuv. & Val.); it attains the size of four feet, but is generally preferred when measuring only two feet in length, or a little less. The drum-fish *(Pogonius chromis*, of Cuv. & Valenciennes) is next in size, and is also a much esteemed fish, though not so much as the sheep-head, *(Sargus ovis,)* which holds precedence over it and the bay mackerel, as well as the sea-trout. Among the pan fishes none can be better than the white perch, *(Bodianus pallidus*, of Smith,) or the sun perch, *(Labre aurite?* of Lacepede.) Another much esteemed pan fish has received the trivial name of crocus perch. The more common kinds are the yellow perch, *(Perca flavescens*, of Cuv. et Val.) the pike, *(Esox reticulatus*, of Lesueur,) the catfish, *(Silurus catus,)* the shad, *(Clupea alosa,)* herring, *(C. harengus,)* alewives, *(C. fasciata?* Les.) and the eel. The lamprey is also occasionally offered, but from some unaccountable prejudice, is by most persons rejected. The Ichthyology of the Chesapeake bay is so far, however, but little known.

north-east to south-west; a further actual examination of the topography of their banks will indicate a gradual depression in its whole mass from north to south, so that the traveller in this direction moves down a gently inclined plane. In the upper portions of the Shore, south of the Elk, the river banks are high, the country about them irregular, sometimes hilly, more especially towards the heads of the streams, whilst the intervening space between these presents an almost unbroken level. North of the Choptank there are no marshes of any extent; but in the sinuosities of this river, at the salient points of both shores, marshes extending over from ten to a hundred acres occur, that now afford good, though not always very safe, pastures, being in some places quite miry. It has been suggested elsewhere that they might be effectually reclaimed by cutting them loose from the main land, allowing them thus to be drained in all directions.* Similar marshes exist on the Nanticoke, and where the tide-waters become fresh they have recently been resorted to as rice lands, it is said with entire success.

Another interesting feature in the physical geography of the Eastern Shore of Maryland presents itself in those portions forming the southern part of Dorchester and western side of Somerset counties. The rivers here, of which the principal are the Blackwater, Transquacking, Nanticoke, Wicomico and Manokin, have their mouths converging into one large estuary, called Tangier's sound, which is separated from the bay by a succession of almost continuous low marshy islands. A great portion of the necks between these rivers consists also of extensive salt marshes, with here and there only some more elevated spots of dry land. From the present condition of this estuary it is easy to foresee that it will before no very great length of time be completely filled up with the slime that is carried down by the rivers, the sluggishness of whose course allows it to be quietly deposited, whilst the barrier of islands previously alluded to prevents its wider diffusion through the waters of the Chesapeake. The commencement of this process of filling up already shows itself in what is termed Fishing bay, where an immense and daily increasing accumulation of mud has within the last fifty years rendered it

* Report on the new map of Maryland, 1835.

necessary to diminish the draft of the vessels that navigate these rivers. A like operation is going on at the mouth of the Pocomoke.

That part of Maryland which lies on the Atlantic ocean also presents some interesting features in its physical geography. It embraces the eastern side of the lowest Eastern Shore county, (Worcester,) the main land of which is separated and protected from the surf, by a sandy beach, at present, extending unbroken the whole length of the Maryland sea-coast. The intervening sheet of water is known as the Sinepuxent sound: it is a shallow sea, interspersed with broken marshes, the free navigation of which is further interrupted by reefs of oyster rocks. Here also the process of filling up is gradually going on, the more rapidly since the inlets of the ocean into it have become obstructed, a circumstance which by altering the condition of its waters has brought about the destruction of vast quantities of oysters and clams that formerly constituted an important resource to the inhabitants of its shores. Until lately the sandy beach just referred to consisted of a series of islands, some of which were tolerably well wooded, as those on the Virginia coast now are, they were then inhabited by a race of horses called Beach ponies, supposed by some to be a distinct race, but are most probably degenerated individuals of the ordinary domestic races that, having crossed the sound and taken shelter on these islands, stinted in their food and exposed to the inclemency of the weather, have lost the characters of their breed. They are remarkable for their small size, which is that of the Shetland horse, not generally well formed, are mostly hog-backed, and have a short body with a thick neck and thin legs; some have been seen however, well proportioned, with a graceful appearance and spirited gait. They are all remarkably hardy. Only a few of these Beach ponies remain on the Virginia islands, having been not many years back almost totally destroyed by an inroad of the ocean, to which these tracts of land are naturally exposed.

It has already been stated that the Eastern Shore consists principally of sandy hills and extensive plains of stiff clay. The soil which overlies these deposites of sand and clay necessarily partakes of the nature of the substratum; being occasionally a sandy or a clayey loam, the former when properly cultivated yielding good crops of corn, rye and oats, whilst the latter is more congenial to the growth of wheat. The original growth upon the stiff clay bottoms appears to have been the white oak (*Quercus alba*,) which having been removed is replaced by pines, (*Pinus strobus et variabilis*,) with an undergrowth of holly (*Ilex opaca*,) sweet gum, (*Liquidambar styraciflua*,) and in some places with a great profusion of the sweet-briar, (*Rosa rubiginosa.*) Where the original characters of the soil have not been entirely destroyed, the timber consists principally of magnificent oaks, (*Q. phellos, nigra, tinctoria, &c.*) maple, (*Acer rubrum*,) beech, (*Fagus ferruginea*,) sweet gum, American poplar, (*Liriodendron tulipifera*,) and dog-wood, (*Cornus Florida.*) In low swampy situations the alder, (*Alnus serrulata*,) is associated with the *Kalmia*, the fringe tree, (*Chionanthus Virginica*,) the *Cephalanthus* and the magnolia, (*M. glauca*,) which throws a delightful fragrance through the air. On approaching the Pocomoke, the Cypress makes its appearance, of which there are two species, an evergreen *Cupressus thyoides*, and one deciduous *Cupressus disticha.* The river in fact, takes its rise in an extensive swamp, situated partly in Maryland and partly in Delaware, called the Cypress swamp from the profuse growth amidst it of this valuable timber. Its eastern side, which is more swampy, is also covered by a heavy growth of oak and cypress, and when cleared and drained, presents a stiff clay soil, that invariably throws up young shoots of papaw (*Porcelia triloba*) and persimmon, (*Diospyros Virginiana*). The soil of the Eastern Shore of Maryland has also been found very congenial to the growth of the mulberry, both white and red, (*Morus alba et rubra*,) the latter being a native of the state; but neither the Sylva nor Flora of this section of country have been fully studied. The latter is said very much to resemble that of South Carolina.

The resources derived from the waters by the inhabitants of these lower counties are very considerable. They supply them with a large quantity of oysters, and what are here called man-o-noses, (*Mya mercenaria*,) the former of which are regularly seeded, or planted, or set, as it is variously termed, being brought from other parts of the Chesapeake bay, where they are small and fresh, and thrown into coves at the mouths of the Nanticoke, Wicomico and Manokin, in which places they are found to acquire both size and flavour. Thence they are boated to Baltimore, but principally shipped to the northern ports, occupying in this way during the winter season a numerous fleet of small coasting vessels. On the verge of the great salt water marshes of Somerset county the same thing is done with the clams (*Venus mercenaria*,) that are brought from within the capes of Virginia, and the fishing of these together with the dredging for terrapins (*Emys centrata* of Say,) gives employment to a numerous class of hardy fishermen and boatmen. The terrapins are also frequently parked; that is, a square ditch being dug out so as to admit of the flow and ebb of the tide, is then planked round at an elevation of three to four feet; into this the reptile as he is caught throughout the summer is thrown and fattened upon clams, crabs, or other food. Several thousands are thus assembled together in a pen and throughout the winter disposed of at greatly advanced prices. The extensive marshes that occur here, also supply a quantity of eggs, deposited by the numerous kinds of sea-birds, whilst the muskrat (*Ondatra zibethicus*) and otter (*Lutra Canadensis*) that frequent them are keenly hunted for their skins.

The topography of the Western Shore of the Chesapeake bay, even when confined to those portions of it upon the tide water, differs materially from that of the country which has just been the subject of description. In reviewing it, it will be most convenient to have regard to a striking natural division produced by the course of the Patuxent, which separates the lower Western Shore counties into two distinct peninsulas; the lower one lying between the Potomac and Patuxent, embracing the counties of Prince George's, Charles and St. Mary's; the upper bounded by the latter river, the Chesapeake bay, and the Patapsco, comprising Ann Arundel and Calvert counties. The Potomac side of the former division, commencing at the north-east branch, exhibits a succession of abrupt hills, crowned by plateaus of variable extent and sloping gently towards the south-east. On the table land the soil is principally in an exhausted condition, the effects of a bad system of husbandry anciently pursued, and of the continual washings to which it is subjected. The upper portions of the country are gravelly, this character being more marked on the slopes of the hills and towards the river than lower down the peninsula, or inland, where the soil is chiefly a sandy loam. In the beds of the branches, an alluvial soil formed by the washings from the hills is found better constituted, though principally also of a very light character. When these ravines acquire more extent, as they are observed to do from the Piscatawa to the Wicomico, so as to present long and broad valleys, a corresponding improvement in the soil is discovered. This is the case with the valley of the Piscatawa, a part of Mattawoman swamp, Port-Tobacco bottom, and portions of Allen's fresh. But the best lands occur on the levels along the Potomac, where the soil is formed by the washings from the elevated country which bounds them to the north and east. Some of these flats are of considerable extent, increasing in this respect from north to south, and are covered by sandy or clayey loams, or occasionally stiff clays, that yield good crops of wheat, corn, and tobacco. When wooded the timber consists on these levels principally of oaks, with several species of walnut and hickory, (*Juglans nigra et cinerea* and *Carya alba et compressa;*) and along the river shores the sycamore, (*Platanus occidentalis*,) on the uplands the pines, (*Pinus inops*,) and the red cedar, (*Juniperus Virginianus*,) predominate, though occasionally large tracts of woodland occur, here also, covered with the usual forest trees. At the extremity of the peninsula the country is low, with a sandy soil, but it does not terminate as on the opposite shore of the bay in an extensive marshy surface. On the Patuxent side, where the ridge-land acquires its greatest elevation inclining gradually towards the south, the country is very irregular and broken, being a succession of short hills separated by narrow and deep ravines, and spurring towards the river, which they sometimes reach, they form banks of from ten to thirty feet in elevation, though they more generally terminate at a quarter or half a mile from it, leaving an interposed level. This description belongs more particularly to the Patuxent side of St. Mary's county; for, on ascending the peninsula the country still hilly, more elevated and more broken, presents on the borders of the river in its numerous bends, extensive marshes, the retreat of the snapping turtle (*Chelonura serpentina* of Say,) and of the otter and muskrat.

The soil on the ridge varies from sandy to clayey, sometimes unmixed, whilst the hills and valleys between it and the river are composed alternately of sand and gravel, white and ferruginous clays, forming a soil varying from sandy and clayey, to sandy and clayey loam, which, according to circumstances, is very productive in corn, tobacco and oats. The river flats are generally a stiff clay. There is, however, a very perceptible improvement in the natural condition of the soil after reaching the western branch of the river, between which and the north-east branch of the Potomac lie the famed forest lands of Prince George's. These are variable mixtures of sand and clay that are found to be most readily enriched by the use of clover and plaster, and yield abundant crops of a bright leaf tobacco: they produce abundantly too in corn, (*Zea mays*) and could be made, by the addition of lime or calcareous matter, excellent wheat lands. The soil appears to be peculiarly favourable to the growth of the locust (*Robinia pseudacacia;*) it also allows of the partial cultivation of the cotton plant (*Gossypium herbaceum*).

Formerly the native forests that covered this peninsula, were inhabited by the deer (*Cervus Virginianus;*) but they have been nearly, if not entirely destroyed; so that the lover of field sports is now restricted to chase the American hare (*Lepus Americanus;*) or to the more rustic amusement of dislodging either a raccoon, (*Procyon lotor;*) or an opossum, (*Didelphis Virginianus*). The brakes and stubble still furnish, however, to the sportsman smaller game from the feathered tribe, of which the most esteemed is the partridge (*Perdix Virginiana*). The ortolan (*Emberiza orizivora*) is also shot, at certain seasons of the year, in the neighbourhood of the Mount Pleasant ferry and of Queen Ann; whilst on the setting in of the winter the mouths of the creeks that make in from the Potomac and Patuxent, and the waters of these rivers are covered with large flocks of wild ducks and geese (*Anser hyperboreus*). The fisheries on the Potomac side likewise furnish a great resource to the inhabitants of this peninsula.

The second division mentioned above, possesses, as would naturally be expected, many characters of resemblance with the one that has just been described. Commencing at its lowest extremity it presents on the bay side perpendicular cliffs from fifty to one hundred feet high, exposed at first to the south-east and then forming an almost uninterrupted mural escarpment thirty miles in length, disposed in a curve of great radius to the north east, constituting the bay side of Calvert county, from which the country inclines to the south-west towards the Patuxent. In this direction the country is hilly, possesses a kind soil, is easily improved, and affords good tobacco and oat lands, whilst the stiffer portions yield tolerable wheat crops. This good soil rarely extends, however, beyond one mile from the bay side, after which it becomes very sandy and sour, throwing up a thick growth of pine. On the richer bottoms, there is an abundant growth of oaks, hickory, together with the white and yellow ash. At the extremity of the peninsula, the soil is a stiff clay, especially on the bay side, and in its present condition is valuable for little more than its timber, which is principally pine. On the Patuxent side, however, there are levels extending from the highlands, possessed of a clayey soil susceptible of the highest degree of improvement. In the central portions, the country is hilly, with mostly a light sandy soil, though occasionally clayey, generally well adapted to the growth of tobacco, oats and rye, and when wooded the prevailing trees are oaks, chestnuts (*Castanea vesca*,) pines, and some magnificent specimens of the American poplar. The soil in this, as well as nearly all the tide-water country, produces the red and white beet (*Beta vulgaris et cicla*) abundantly and of remarkable sweetness. The same characters of soil and configuration of country belong to the lowest portions of Anne Arundel county, with this exception, that the highlands do not reach the bay, but terminate abruptly in an extensive tract of low, level, clay lands, denominated, probably by contradistinction, the swamp.

What in Anne Arundel county is locally styled the West river district, offers a considerable body of excellent tobacco and corn lands, that have been greatly improved by the use of clover and plaster, and in their present condition form some of the most valuable plantations in the state. The soil varies from a sandy to a clayey-loam, in some places very ferruginous, it likewise produces abundant crops of oats, and with the addition of lime would yield plentiful returns of wheat.

A soil of the same description extends to the head of South river. The neck of land upon which Annapolis is situated, lying between the latter river and the Severn, is mostly sandy, in some places a highly ferruginous sand: it is principally occupied by pines, the dog-wood and the sumach (*Rhus coriaria*); but it is found very susceptible to improvement, is remarkably favourable to the culture of the water-melon (*Cucurbita citrullus*,) cantelope (*Cucumis melo*) and to the other plants of the same family. Several varieties of peaches, pears, cherries and plumbs are raised in abundance and with success, whilst the precarious apricot (*Prunus Armeniaca*) occasionally attains to a healthy maturity. The vine (*Vitis vinifera*) also seems to be cultivated here with more success than in other portions of the state, whilst the native fox grape, (*Vitis vulpina*) and plum-grape (*V. labrusca*) thrive vigorously every where. Near the head of the Severn, the Scotch broom (*Spartium scoparium*) has been introduced and is spreading wide and fast, to the annoyance of the farmer, although it is generally considered a useful plant in the agriculture of Europe. Broad-neck, between the Severn and the Magothy, the Bodkin-neck, as well as those that border on the Patapsco, are covered by a light soil, which in consequence of some peculiarities, perhaps in its exposure, seems to be more congenial to the growth of the peach tree; the finest kinds of this delicious fruit that are brought to the Baltimore market, being from this quarter. In the upper parts of these necks, the soil is extremely sandy, mostly covered with pines. This is also the region of the chestnut and chinquepin (*Castanea pumila*,) after leaving which, and crossing a gravelly ridge, the Patapsco is reached.

The upper portions of Anne Arundel county will be referred to in another place; but before leaving the lower Western Shore counties, it may be well to mention some of the wild animals that are known still to inhabit them. It has already been said that the American hare, the raccoon and the opossum are frequently met with; the gray and red fox (*Canis Virginianus et fulvus*) are also very numerous. There are four species of squirrel found—the gray squirrel (*Sciurus cinereus*) the brown squirrel (*Sciurus capistratus?* of Bosc,) the flying squirrel (*Pteromys volucella* of Desmarest,) and the ground squirrel (*Sciurus striatus*,) which together with probably two or three species of weasels (*Mustelæ*,) and the polecat (*Mephitis Americana*) are the principal wild quadrupeds that frequent our woods at present.

The next division of the tide-water country will embrace the lower parts of Baltimore and Harford counties, of which it forms, however, but a very small portion. That portion of it lying between the main branch of the Patapsco, and the one upon which Baltimore is located, consists of clay and sand hills covered in many places with a thick coat of gravel; its soil is very indifferent; and as the best timber which it originally bore has been long since removed, it is now covered by stinted oaks (*Q. chinquapin et Q. elicifolia*) red maple, chestnut, chinquapin and cedar; the red ochrey clay that occurs in this region being apparently very favourable to the growth of the last mentioned tree. It is remarked of it that in a narrow belt of land extending in a north-east and south-west direction through the state, it presents great symmetry in its form, being that of a double cone applied base to base, with the upper cone elongated and perfect; but when removed from this belt its branches soon become irregular and straggling. The smaller growths that occur in this division are the whortle berry (*Vaccinium dumosum et frondosum*) several species of *Rubus*—the blackberry, dewberry and others, the calico-bush (*Kalmia latifolia*) the sheep laurel (*K. angustifolia*) the wild honeysuckle (*Asalea nudiflora*) and along the river shores the sweet-scented clethra (*C. alnifolia*).

Baltimore situated on the upper limits of the great Atlantic arenaceous and argillaceous deposites resting upon the chain of primary rocks, offers in its vicinity, soils, which in connection with their geographical position under the same parallel as the most southern parts of Europe, permit the cultivation of perhaps a greater variety of esculent plants and fruits than are met with in the neighbourhood of any of the other large cities of the union. Besides the ordinary vegetables and roots that are found every where, with which the Baltimore market is amply supplied, there have been introduced a variety of exotics from warmer climates, that are now ranked among the most wholesome and grateful of the summer vegetables. The principal of these are the okra of the West Indies (*Hibis-*

cus esculentus,) the tomato (*Solanum Lycopersicum*) the egg-plant (*S. melongena*) and the salsafy, sometimes called oyster plant from its peculiar flavour when fried, not unlike that of fried oysters, it is the *Tragopagon porrifolius* of botanists. It has been found also that the fig-tree (*Ficus carica*) can with proper attention be made to thrive and bear abundantly; and the grape in its numerous varieties is cultivated in the city and around it with complete success.

In the upper parts of the necks that form the lower portions of Baltimore county, the soil is gravelly and sandy, and its best timber is principally replaced by chestnut; but midway between the heads of the creeks and the river shore, there is a zone of rich land covered by a fine growth of oaks, hickory and the American elm (*Ulmus Americana*,) after which the necks terminate either in a light sandy soil occasionally shaded by pines, or in stiff clays that furnish good wheat lands. The same characters belong to the necks of Harford county, with this exception that the clayey levels are overgrown with large white oaks.

The rivers that form these necks are principally near their mouth, and the littoral waters of the Chesapeake bay in this direction, produce aquatic plants that seem peculiarly grateful to the wild ducks. It is here accordingly that this wild fowl assembles at the approach of winter, in numerous flocks, comprising several species, among which the most esteemed for the delicacy of their flesh, is the canvass-back duck (*Fuligula Valisneria*) and the red-headed duck, (*Fuligula ferina.*) The former has received its specific name from the supposition that it feeds entirely upon the *Valisneria Americana*, but those who are well acquainted with the habits of the bird, have satisfied themselves that although it certainly prefers this kind of food, it freely partakes of others; its principal advantage lying in its superior strength, which enables it to dive deeper and to feed upon the more tender parts of the various plants that it succeeds in bringing up from beneath the waters; whilst its less active associates are contented to feed upon what it rejects, compelled even sometimes to have recourse to fish and muscles that entirely destroy their flavour.

The preceding account embraces the physical geography of the tide water country, comprising about two thirds of the whole territory of Maryland. It will have been perceived that its soil chiefly composed of sand and clay, is evidently one of transportation, and although very variable according to localities, possesses, considered as a whole, great uniformity of character. It presents on the other hand, a striking difference when compared with that of the division of country next to be considered. The portion of Maryland included within this division embraces the upper part of Cecil county on the Eastern Shore of the Chesapeake bay, nearly the whole of Harford and Baltimore counties, the upper part of Anne Arundel and most of Montgomery county, on the Western Shore. It comprises a low chain of hills having a north-east and south-west direction, with short spurs to the south-east that present rounded summits, and between which the drainage of the country is effected; all the rivers and water courses in this portion of the state running north-west and south-east. The bed of the rivers is usually at the bottom of a narrow and deep ravine, with steep sides that afford but very small tracts of alluvial soil on their margin. Although the entire mass of hills rises towards the north-west, attaining an elevation not exceeding nine hundred feet above mid-tide, its summit rarely presents any distinct ridge, but rather forms an elevated plateau, intersected, in the direction already assigned to the water-courses, by deep trenches. It affects the appearance of a ridge on its lateral limits, or, in other words, it is itself a broad ridge, from twenty to thirty miles in breadth. The soils that occur upon it have been produced by the disintegration and decomposition of the subjacent rocks, and consequently vary according to the nature of these. Generally speaking the best soil is superincumbent upon limestone; this usually consisting of a dark mould very favourable to the growth of wheat. An excellent wheat soil is also produced by the decomposition of hornblende rocks, forming what in some parts of Baltimore and Harford counties are termed the red lands. The coarser granitic aggregates likewise form a tolerable soil, which readily improves by tillage and by the use of plaster and clover, but more especially by the application of lime. On the other hand the disintegration of the magnesian rocks seems to be totally unfavourable to vegetation.

The agricultural resources of this portion of the state are abundant; and the various schemes of internal communication that are being carried on by opening new avenues, furnish additional facilities to its further improvement, as well as to the more extensive distribution of its produce. Besides the ordinary grain and root crops, as the country is well watered, and that there are many advantageous situations for the formation of artificial meadows, numerous favourable positions are afforded for the creation of dairies and grazing farms, whilst their proximity to a populous city renders every product of rural industry upon them available. All the species of European fruit bearing trees may here be cultivated; but the apple especially, which seems calculated for almost every soil, climate or situation that this state affords, yielding numerous varieties, some of which are highly flavoured and much esteemed as dessert fruits, others are solely employed for making cider. The fruit of the persimmon or American date (*Diospyros Virginiana*) is used for making a species of beer; and the domestic wine obtained from the currant has not unfrequently been passed off even upon professed connoisseurs as tolerable Madeira. Among the forest trees that bear edible nuts are the walnut, shell-bark hickory, the chestnut and the chinquapin that bears a small, but sweet and agreeable fruit. The flowering trees and shrubs, some of which have already been mentioned, are the American poplar, with its large tulip-shaped blossom, the *Catalpa cordifolia* with its showy white flowers, the early blooming *Cornus florida*, the *Cercis canadensis* whose red blossoms attached to the branches have an agreeable pungency, are eaten in salads, and may be made into delightful pickles, the *Chionanthus Virginica*, or Virginia snow-flower, most commonly known as the fringe tree, from its pendulous branches of white flowers, the *Gleditzia triacanthus* or honey locust, several species of the *Cratægus* or hawthorn, and the *Kalmia latifolia*, or calico-bush, the noxious qualities of which lessen the esteem claimed by its beauty. These adorn the Maryland woods in the spring, enlivened moreover by the varied notes of the mocking-bird (*Turdus polyglottus*); whilst the different hues assumed by the fading leaves of the larger forest trees, the deep scarlet of the gum (*Nyssa villosa*) contrasting with the bright yellow of the chestnut, and the blended shades of the evergreens, contribute to impart to them in the fall of the year renewed beauties of a peculiar character.

Frederick county which presents another natural division of the state, is, as now represented upon the maps, traversed longitudinally by the Monocacy, that separates it into two nearly equal portions, one to the east and the other to the west. The most important tributary streams to this river are on its eastern side. Bennet's creek which is nearest its débouché into the Potomac runs by the foot of the Sugarloaf, an isolated saddle-shaped mountain, the first spur from the mass of mountainous country shortly to be reached. The other creeks that water the country in this direction are Bush creek, the Linganore, and the more important twin branches of Pipe creek, flowing through a limestone region that comprises some of the best lands in the state. But the more improved portions of the Frederick-town valley, are on the western side of the Monocacy, where the soil produced by the decomposition of limestone and a red shale, is found to be very productive in corn and wheat. It extends to the foot of the Catoctin mountain, the first chain of importance that presents itself, being a spur of the more elevated ridge known as the South mountain, though more commonly called the Blue-ridge. The direction of this first chain is nearly north and south: it is well wooded, its principal timber consisting of oaks, with some sugar maple (*Acer saccharinum*) and a few hemlock pines (*Abies Canadensis.*) It offers to sportsmen a wide, though rugged field of amusement in the exciting chase of the fox, during which it has happened that a mountain cat (*Felis montana* of Desmarest) has been dislodged. This animal is very rarely met with at present, having been together with the panther so called (*Felis concolor*,) and other wild beasts, either destroyed or driven to more remote retreats. A straggling bear (*Ursus Americanus*) now and then, however, makes his appearance.

The valley of Middletown, situated at the fork of the Catoctin and South mountains, rivals in the beauty of its position, as well as in the value of its agricultural resources that of Frederick-town. It is traversed nearly in its whole length by the Catoctin creek, which receives one or two smaller streams near its head. The soil of this valley, formed of decomposed slates and shales, is easily cultivated, yielding plentifully of corn, wheat and oats, that have now a ready issue to a market through the canal or by the rail-road.

The eastern flank of the South mountain is cultivated a considerable distance up; its soil nearly of the same character as that of the valley, producing heavily of rye and oats. Its timber in the lower regions is principally oak, birch (*Betula excelsa et nigra*) and beach (*Fagus ferruginea*). This is the retreat of numerous coveys of the pheasant (*Tetrao umbellus*,) large gangs of the wild turkey (*Meleagris gallopavo*), and at certain seasons of the year the trees are literally covered with flocks of wild pigeons (*Columba migratoria*). In the upper regions the pines predominate.

Between the South and North mountains, lies the valley of Hagerstown, principally based upon limestone, and possessing a most fertile soil, the cultivation of which is, however, in some measure inconvenienced by the protrusion of the rocky masses that impede the operations of the plough. Corn, wheat, oats, rye, clover (*Trifolium pratense*) and flax, (*Linum usitatissimum*) grow here luxuriantly, and all the cultivated fields have groves of locust (*Robinia pseudacacia*;) the growth of this valuable tree being judiciously fostered by the industrious and intelligent farmers of this portion of Maryland. The valley is traversed midway and nearly through its whole length by the Antietam, between which and the South mountain there lies a minor ridge of mountains, called the Elk, on the south-eastern limits of Washington county. Pleasant valley, a beautiful and highly improved tract of land with a limestone soil, lies in this direction. At the foot of the North mountain, and still in the valley of Hagerstown, flows the Conococheague.

After crossing the North mountain the territory of Maryland is narrowed down to an inconsiderable space on the flanks of lateral spurs that slope abruptly towards the Potomac, on the margin of which there are still some rich alluvial bottoms, though they have been much interfered with by the excavations made for the Chesapeake and Ohio canal. Beyond Hancock, the country becomes very hilly and rugged, being a series of approximate ridges, with numerous transverse spurs, and intervening deep and narrow valleys. This is the region of the pine, fir and larch families (*Pinus*, *Abies et Larix*,) the mountain tops being covered with pines, whilst their flanks, and the ravines along the water-courses, produce the fir, larch and the cypress associated with the oak, birch and beech. Among the flowering shrubs is the magnificent rhododendron (*R. maximum*) contrasting its splendid white roses, with the pink of the fantastical kalmia. The more extended valleys possess a good soil, are abundantly supplied with springs of delicious water, some chalybeate, others sulphurous, and offer pleasant retreats during the heats of summer. The establishment on the Flintstone, twelve miles east of Cumberland furnishes a delightful resting place.

Cumberland, which is one hundred and thirty-six miles from the city of Baltimore, is situated at the confluence of Wills's creek and the Potomac. It is destined to become, so soon as the canal shall have reached it, the most important inland town of the Union, east of the Alleghany mountains; for here will be not only the depôt of the great coal fields in its vicinity, but that of the immense products from the iron works that will ere long be established amidst them, as well as the transient depôt of a great amount of western produce, on its way to the sea-board. Whatever success may attend the contemplated project of connecting the tide-waters of the Chesapeake with the Ohio by means of a continuous rail-way, it is certain, that so soon as the two stupendous works previously mentioned, worthy of the entire patronage of an enlightened government, shall have been completed as far as Cumberland, a decisive epoch in the prosperity, of these remote portions at least, of Maryland will have commenced. At present the judicious location by the United States engineers of the National road through the gorge of Wills's mountain, following the bed of Braddock's run, affords a natural and easy egress from the head waters of the eastern streams to those that empty into the great valley of the Mississippi: for from its source to Cumberland, the Potomac no longer forces its way through the ridges, but runs along their bases; its direction being south-west and north-east. The few breaks that now occur in the mountain masses afford issues, to inconsiderable streams, or rather are the beds of torrents, by which this upland country is drained. After crossing the Great Back Bone mountain, the south-west termination of which forms the extreme limit of the state in the same direction, the streams have a directly opposite course, emptying into the Youghagany, which through Maryland, runs nearly due south.

Besides the vast mineral wealth possessed by this portion of the state—to be more particularly alluded to presently—its agricultural resources are abundant, and need only the inducement which an increased population will soon afford to bring them into full operation. Whenever the soil is cultivated it is found to produce kindly in rye, buckwheat (*Polygonium fagopyrum*) and oats, the latter very heavy and highly esteemed. On the new lands tobacco is raised with success, and its quality represented as superior, being of the bright leaf kind that always commands a high price. The more mountainous districts, present broad valleys that bear the evidences of having been the beds of extensive lakes now dried up or drained, the waters of which have left behind them deep deposites of a clayey loam. These beautiful tracts of country have received the name of *Glades.* From their elevated position and their constantly moist condition, they form very productive meadows and the most luxuriant pastures. Nothing in this way can surpass the beauty of these glades during the flowering season, when they are covered with numerous showy plants; the golden lily (*Lilium Canadense*,) and the *Lobelia cardinalis*, blending their rich hues, with the lively colours of several species of *Phlox* and *Aster.* The forests afford also a great many species of the most valuable kinds of timber—the white and black oaks, beech, white and black walnuts, the magnolia (*M. accuminata*,) called here the cucumber tree, overshadowing a luxuriant growth of large herbs, as the *Collinsonia Canadensis*, *Œnothera grandiflora*, several species of *Monarda*, *Helianthus* and *Rudbœkia.* This is likewise the region of the sugar maple, (*Acer saccharinum*,) annually tapped in the spring for its saccharine juice, which when concentrated yields a wholesome sugar.

The abundant pasturages afforded by the glades, and other parts of Allegany county, render them peculiarly well suited to grazing and dairy farms; the *glades-butter* being already celebrated for the delicacy of its flavour. Some farmers also possess numerous flocks of sheep, that find in these mountain pastures plants that impart a peculiar savouriness to their flesh, the *mountain-mutton* being equally in high repute. The deer, although disappearing fast, is still an inhabitant of these mountains, and together with the hare, the wild turkey and pheasant, that here abound, furnish ample and profitable occupation to the huntsman. Notwithstanding all that is narrated of panthers and bears, it is believed that they seldom make their appearance, the most dangerous foe likely to be encountered being the rattle-snake, (*Crotalus horridus*,) or other venomous reptiles of the same kind. The clear and cool streams that water the glades, finally, furnish a delicious trout (*Salmo fario*,) whilst the more considerable branches supply a species of large eel which is much esteemed.

Having thus furnished an account of the great outlines in the physical geography of the state, it will be necessary now to indicate its prominent geological features, from its western limits to the sea-board.

The most important feature in the geology of Allegany county is derived from the occurrence within its limits of two extensive coal-measures, embracing considerable deposites of iron-ore. The first, believed to be the larger of the two, but the more remote, occupies the basin of the Youghagany, lying between the Briery mountains and the Winding ridge at the north-west corner of the state. The largest bed of coal in this district, which has been so far only partially examined, is said to measure twenty feet in thickness, and to be of excellent quality. Smaller beds associated with argillaceous iron-ore were found much mixed with shale containing iron pyrites. On the western slope of Winding ridge there occurs an extensive deposite of clay, embracing nodules of argillaceous iron-ore, resting upon sandstone and covered by a stratum of calcareous marl. This deposite also contains nodules of a mineral substance, consisting of lime, clay and oxide of iron, answering very nearly the description of the substance that yields the Parker's cement of English writers. The other accompanying strata are principally slates and shales, with subordinate beds of limestone. And the only useful mineral as yet known to exist in this portion of the state, besides those just mentioned, is oxide of manganese, occurring of good quality on Bear creek, and very ferruginous on Keyser's ridge.

The Frostburg coal field, lying between Dan and Savage mountains, covers an area of about two hundred square miles, and its depth is computed to be at least fifteen hundred feet. It rests unconformably upon a red sandstone containing *Producti*, its bottom rising to the north-east and laterally towards the Savage mountain to the north-west and Dan's mountain to the south-east; so that its strata dip transversely west from the latter chain and east from the former. This dip is irregular, the strata being in the south-east portion of the field more curved towards Dan, and rising gently on the side of Savage, whilst in its north-west division, the strata run up more rapidly towards the latter than the former mountain. The inferior strata that are continuous most probably crop out towards both extremities at a considerable elevation in the mountain forming the lateral limits of the basin, where they are covered unconformably by strata of mill-stone grit. There are four principal beds of coal embraced within this important deposite, of which the main one is fourteen feet thick, being composed of an alternation in unequal proportions of two distinct varieties of the combustible, the predominant variety possesses considerable lustre, the other is dull, hard, and somewhat resembling Cannal coal. The elevation of this bed above tide is nearly seventeen hundred feet and one thousand and fifty feet above Cumberland. The next important bed is called the eight feet bed, at an elevation of eight hundred and ninety-eight feet above Cumberland; it yields a solid coal with a cubic fracture, containing 80 per cent. of carbon. The deposites of iron-ore, associated with the coal are found principally below this bed; they are mostly argillaceous carbonates of iron, their specific gravity varying from 3.2 to 3.5, and contain from 30 to 40 per cent. of metal. In the upper portions of the coal-field red and brown hæmatites occur, but not in continuous deposites.

It is worthy of remark that in the whole of this coal formation, equal in extent to that which has been styled, 'the great coal field of Northumberland and Durham,' in England, there is no reason to suspect the occurrence of a single *fault*, or dislocation of the strata. Its surface is irregular, the ravines of the water courses having penetrated into it to great depths, but the irregularities are solely due to powerful excavating causes acting upon its surface, that have removed perhaps more than two-thirds of the whole mass, as it existed at its first deposition, without affecting the dip or inclination of the strata. The accompanying rocks are those usually found in coal-measures; namely, sandstone, limestone, slates and shales, containing but few organic remains. The *Fucus Alleghaniensis* and some *Calamites* are seen in the sandstones, the nodules of argillaceous iron-ores envelope impressions of leaves and stems of some undetermined plants, and the limestone contains *Terebratulæ*.

No coal has been found on the east side of Dan's mountain, the millstone grit that occurs at its summit, being replaced at its base by limestone and red sandstone. In the valley of Braddock's run, also, the prevailing rocks are the red sandstone with compact limestone of various colours; they contain no organic remains, and their strata are nearly vertical. The gap in Wills's mountain, which presents a great natural section of the ridge from ten to twelve hundred feet wide, extending to the base of the mountain and forming an excavation of not less than eight hundred feet in depth, exhibits the red sandstone as forming the base of the mountain, with superimposed strata of a fine grained white sandstone. On the northwestern side of the gap, the strata of white sandstone are nearly vertical, they curve over the summit of the mountain, and on its south-eastern side descend at an angle of about 30° to its foot, where they are covered by a blue limestone.

In the vicinity of Cumberland the rocks are limestone and slates. Some of the limestones are slightly bituminous, and their mass is traversed by large veins of quartz, that having offered more resistance to the disintegrating effects of water and atmospheric agents, occasionally protrude much beyond the rocky strata with which they are associated. They then occasion remarkable appearances in the rocky masses of the mountain, that never fail to attract the attention of the ignorant, who, unable to account for them, are yet very ready in assigning to them an object. An occurrence of this kind, on the north-west slope of Wills's mountain, has in this way received the name of the Devil's sliding place. Between Cumberland and Sideling hill—being a succession of ridges and spurs from more lofty ones—the rocky strata consist of variously coloured sandstones thrown up at all degrees of elevation and dipping in every direction, with interposed bands of *encrinital* limestone. The highest ridges are invariably capped by white sandstone with a loose texture, in some places disintegrated into a fine sand. Some of the rocks in this region contain fossils that are said to be analogous to those of the carboniferous limestone of the western country. The limestone is here cavernous—a general character belonging to the blue limestone west of the range of primary rocks—as is shewn by the passage of a part of the waters of Flintstone creek under the Warrior mountain, and their re-appearance on the opposite side. Thermal springs, and springs charged with sulphuretted hydrogen, together with some chalybeates, likewise occur in this portion of the state.

The rocks in the neighbourhood of Hancock are also fossiliferous, containing *Trilobites*, *Producti*, *Spirifers*, &c. they present the same recurrence of limestones, sandstones, with occasional seams of bituminous shales, and the mountain tops are covered by a fine grained, friable, white sandstone. Specimens of argentiferous galena have been received from this quarter: several localities of iron ore associated with oxide of manganese are known to occur, and in a corresponding region on the Virginia side of the Potomac, anthracite has been discovered within the last year.

The body of the North mountain seems to be composed of slates and red sandstones, with a superincumbent deposite of a more recent white sandstone, in which however, no fossils are known to have been detected. In the valley between this chain of mountains and the South, or Blue ridge, the prevailing rock is the blue limestone, which is cavernous; its strata are highly inclined, dipping in various and opposite directions and do not contain any organic remains. At the confluence of the Conococheague and Potomac, in the vicinity of Williamsport, the slate rocks appear with lines of fracture, and of stratification so very confused, that it is impossible to ascertain their dip and direction. Near Sharpsburg the rocks are principally limestones, and on the road from this place to Boonsboro' the rock assumes a variety of colours, constituting blue, yellow, red, fine grained marbles that admit of a good polish. In Pleasant valley, white statuary marbles of superior quality have been quarried; but the masses are not large, the strata in the upper portions of the formation being rather thin. It is possible that at greater depths, they will present thicker and more valuable beds. At the débouché of this valley, on the Potomac, there is an extensive deposite of brown hæmatitic oxide of iron, wedged in, in nearly a vertical position between layers of blue limestone. Similar ores have been found on the west slope of the Blue-ridge.

The excavations for the canal and rail-road both at Harper's ferry and at the Point of Rocks, the former being the termination of the Blue-ridge in Maryland, and the latter that of the Catoctin mountain, shew that the mass of the South mountains is composed of primary rocks. These rocks are talcose slates and quartz rocks, with slight indications of metallic copper; epidotic and chloritic rocks, with amygdaloids, on the eastern slope of the Catoctin and western slope of the Blue-ridge, that are uncovered at the north extremity of the ridge, whence having been detached, they form large bowlders in the fork of the two chains; serpentine rocks; and finally granular limestone, occurring near the foot of the Catoctin on the eastern side. The tops of this mass of mountains are covered by a white remarkably compact sandstone, with veins of crystalized quartz, and containing native copper, pyritous copper, specular oxide of iron, &c. It is doubtless a metamorphic rock of an elder secondary period; its beds are very much shifted, and its stratification quite undeterminable. It does not appear to contain any organic remains.

In the upper portions of Frederick-town valley the prevailing rocks are the blue limestone and red sandstone, and in the vicinity of Mechanicksburg the limestone conglomerate, so well known as the breccia of the capitol, consisting here of calcareous pebbles of variable dimensions imbedded in an indurated red shale, crops out in sundry places. East of the Monocacy, on the branches of Pipe creek and Sam's creek, near Liberty and New Market, variegated marbles of great beauty are found. In the vicinity of New London, on the Linganore, specular oxide of iron occurs, and lead has been discovered in that of Unionville, while Woodsborough is the centre of a limestone formation traversed by veins of sulphuret of copper, that have already been worked to advantage.

The black oxide of manganese occurs in the neighbourhood of New Market; so that this portion of the Frederick-town valley may be styled its metalliferous region. The limestone in which the metallic veins are principally found is contiguous to a series of argillites, through which large bands of quartz rock project perpendicularly, and having more effectually resisted the progress of disintegration in the whole mass, form low unbroken walls, sometimes of considerable extent. These slates belong to the series of primary rocks that extend eastward to the tide-waters.

Descending the valley, at the foot of the Catoctin there is an extensive deposite of hæmatitic brown oxide of iron associated with phosphate of iron, and a similar ore is found, which was formerly abundantly raised, near the Point of Rocks. At the Yellow springs, on the head waters of the Tuscarora, a deposite of black shale containing vegetable matter, and overlaid by conformable beds of grey sandstone were observed, which render the recurrence of bituminous coal possible in this locality. Anthracite has certainly been discovered on the Monocacy in thin seams running through the red sandstone. The capitol breccia again makes its appearance west of Fredericktown, and continues protruding itself in knolls, and forming the masses of a low range of hills between the Catoctin mountain and the Monocacy, extending in a north-west and south-east direction across the Potomac. At the foot of the south-western slope of the Sugar-loaf mountain, quarries of coloured sandstone, and of a beautiful white freestone, composed of grains of semi-transparent quartz, cemented together by a talcose mineral, traversed also by veins of crystallized quartz have been quarried—the latter being the material of which the splendid aqueduct over the Monocacy is constructed.

Entering Montgomery county in this direction, the red sandstones occasionally of light grayish red colour, continue to make their appearance, and are extensively quarried near the mouth of Seneca creek, where they envelope vegetable remains, principally *Calamites*, and are occasionally traversed by very slender veins of anthracite. They are succeeded by argillites, and within a short distance of Rockville, the serpentine formation containing beds of chromiferous iron is reached, being about the centre of a group of primary rocks, that occupy nearly the whole of Montgomery, the upper portions of Anne Arundel, much the larger parts of Baltimore and Harford counties, and crossing the Susquehanna a little above Havre de Grace, form the substratum of the table land in the upper districts of Cecil county.

The rocks belonging to this group are principally the usual granitic aggregates of primary formations, such as coarse, fine grained, and porphyroidal granites, gneiss, hornblende rocks, sienite, limestone, micaschist, serpentine, steatite, talcslate, clay-slate and argillites, alternating with each other and passing into each other in such a way as to render it difficult to affix specific names to their different mixtures. They afford in themselves most valuable materials that are employed in a variety of ways for ornamental or useful purposes, and contain, moreover, deposites of metals and other minerals that furnish large supplies to the agricultural and manufacturing industry of the state. Among the metals imbedded in them are the chromiferous and titaniferous iron ores; the former more usually called *chrome ores*, being extensively employed for the production of several articles used as pigments and dyes; whilst the latter, when worked with other iron ores, yield a large per centage of metal. The principal localities of the titaniferous iron ores are in the upper parts of Harford county; those of the chrome, are more numerous; the chief localities being in the northern part of Cecil county, in Harford county near Cooptown, in Baltimore county, at the Bare hills, seven miles from the city of Baltimore, at Soldier's Delight, seventeen miles distant, and in Montgomery county, near Rockville. The latter ore invariably occurs in the serpentine formation, which also furnishes silicates of magnesia, that are manufactured on a large scale into the sulphate of that earth, known as Epsom salts. Manganese ore occurs in Montgomery county, near Mechanicsville; sulphuret of molybdenum, graphite, sulphurets of lead and of zinc, have also been discovered, but to what extent has not yet been determined. Kaolin, or porcelain clay, has been discovered in many places, produced by the decomposition of the coarse grained granite, which is very common among the primary rocks of Maryland; it occurs in Cecil, Harford and Baltimore counties.

It has already been stated that the direction of this primary chain is north-east and south-west; its south-eastern flank being covered by extensive arenaceous and argillaceous deposites, referrible to the secondary and tertiary periods. On the Western Shore of the Chesapeake bay, the deposites belonging to the secondary period are more extensive, it is believed, than is generally admitted. Those that are contiguous to the primary chain are composed of ferruginous sands and clays, enveloping masses of ferruginous sandstones, ochres, ironstones, nodules of carbonate of iron disposed in beds, and in their lower portions, *Lignites*. They are in many places covered by large bowlders; but more generally with coarse gravel, which does not extend however, beyond a few miles from the upper limits, when it disappears, leaving the sands and clays uncovered, still very ferruginous, and after crossing the head of the Severn much mixed with green particles. North of this, on the banks of the Magothy, there occurs a considerable deposite of *Lignites*, associated with iron pyrites and amber, containing nests of insects converted into amber that appear to have been formed around the smaller twigs of the wood from which the *Lignites* have been produced; but no other fossils have been discovered. Six miles from this locality, south, on the banks of the Severn, there is a deposite of micaceous black sand offering indisputable proof, in its fossil contents, though in a very imperfect state of preservation, of a secondary character; being *Exogyra*, casts of *Cucullœa Mortonii*, associated with *Lignites* and amber. Other analogous formations, possessing the same mineralogical characters, and the same geological features occur so frequently in a broad belt of country contiguous to the more obvious tertiary deposites, that although no characteristic fossils have as yet been detected in them, owing probably to their never having been penetrated into to a sufficient depth, it is difficult to resist the belief that they are not of the same epoch. Thus, a micaceous black sand covered by a continuous band of siliceous rock, occurs twenty miles south of the deposite on the Severn, near the Patuxent river, associated with a pure green sand; it reappears under the same circumstances, except the attendant green sand, on the opposite side of the river; it is seen in the neighbourhood of Upper Marlborough, containing fossils, but so disintegrated that they cannot be referred, and it is in the vicinity of a fossiliferous deposite containing particles of green sand, an abundance of *Gryphœa vomer* and other *Gryphœa*, what appears to be the cast of an *Exogyra*, a zoophytic production believed to be referrible to a *Scyphea*, and *Ostrea compressirostra*. It is probable, therefore, that it belongs here as elsewhere to a period older than the Eocene tertiary to which it has been hitherto referred. In the valley of the Piscataway a similar deposite occurs to that at Upper Marlborough, comprising mostly, however, among the species that can be determined *Ostrea compressirostra;* at Fort Washington, Mr. Conrad found 'a solitary valve of *Exogyra*,'* associated with *Cucullœa gigantea*. On the banks of the Potomac, near Indian point, there is an analogous formation, and still further down, between the mouth of Port Tobacco river and Pope's creek, a mixed green sand occurs, in which are found the *Gryphœa vomer*, *Ostrea compressirostra*, *Lignites*, *Pyrites* and *Selenite*. All these deposites differ materially from those that are found inland, at the head of the water-courses, constituting what has been elsewhere termed by way of distinction the *blue-marl* of Charles county, and it is remarkable of these, that the only fossil shell observed in them, in the superficial examinations that have been so far made is the *Venericardia planicosta*.†

The fossiliferous deposites on the Patuxent side again differ from the preceding. They commence high up in Prince George's county, are found at the heads of nearly all the water courses, extending down to the extreme end of the peninsula of which they seem to form the substratum. Similar deposites occur in the lower portions of Anne Arundel, and form the mass

* Morton's Synopsis of Organic Remains, p. 19.

† In Mr. Deshaye's Tables of Fossil Shells, appended to Mr. Lyell's Principles of Geology, fourth edition, the different species of *venericardia* and *cardia* are assigned as occurring in *six* localities of the Pliocene period, *fourteen* of the Miocene, and *ten* of the Eocene. If the localities previously mentioned, namely, at Upper Marlborough, Fort Washington, and the banks of the Potomac, in Charles county, notwithstanding the occurrence of the *Exogyra* and *Gryphœa vomer*, continue to be referred to the Eocene period, it is more than probable that the *blue-marls* of Charles county, will have to be referred to the Miocene epoch—an opinion originally entertained, but afterwards yielded up. It is thought premature, however, to decide upon a question in reference to which scarcely the elements are possessed.

of that portion of the territory of Maryland, occupied by Calvert county. The cliffs of the latter county, previously described at page 32, present an almost continuous accumulation of marine shells and exuviæ, reaching to an elevation of nearly one hundred feet above tide, and disposed apparently in three distinct layers, though not always recurring together, composed of the same kinds of fossils. It is impossible to assign its extent below tide, which is doubtless very great, as in one instance it has been dug into the depth of seventy feet below high-water mark without penetrating through the fossils. Whether the whole of this immense deposite has been made during one or more geological periods it is difficult to say; and to which of the tertiary epochs it mainly belongs has not yet been satisfactorily determined. The number of marine shells contained in it that have been so far collected amounts to about one hundred and forty species; but the proportion of recent and extinct species among them, has not yet been ascertained. The most constant attendants upon these marine shells are the ribs and vertebræ of a species of *Delphinus*, the palatal bones of some fish, and a great number of shark's teeth of all sizes.

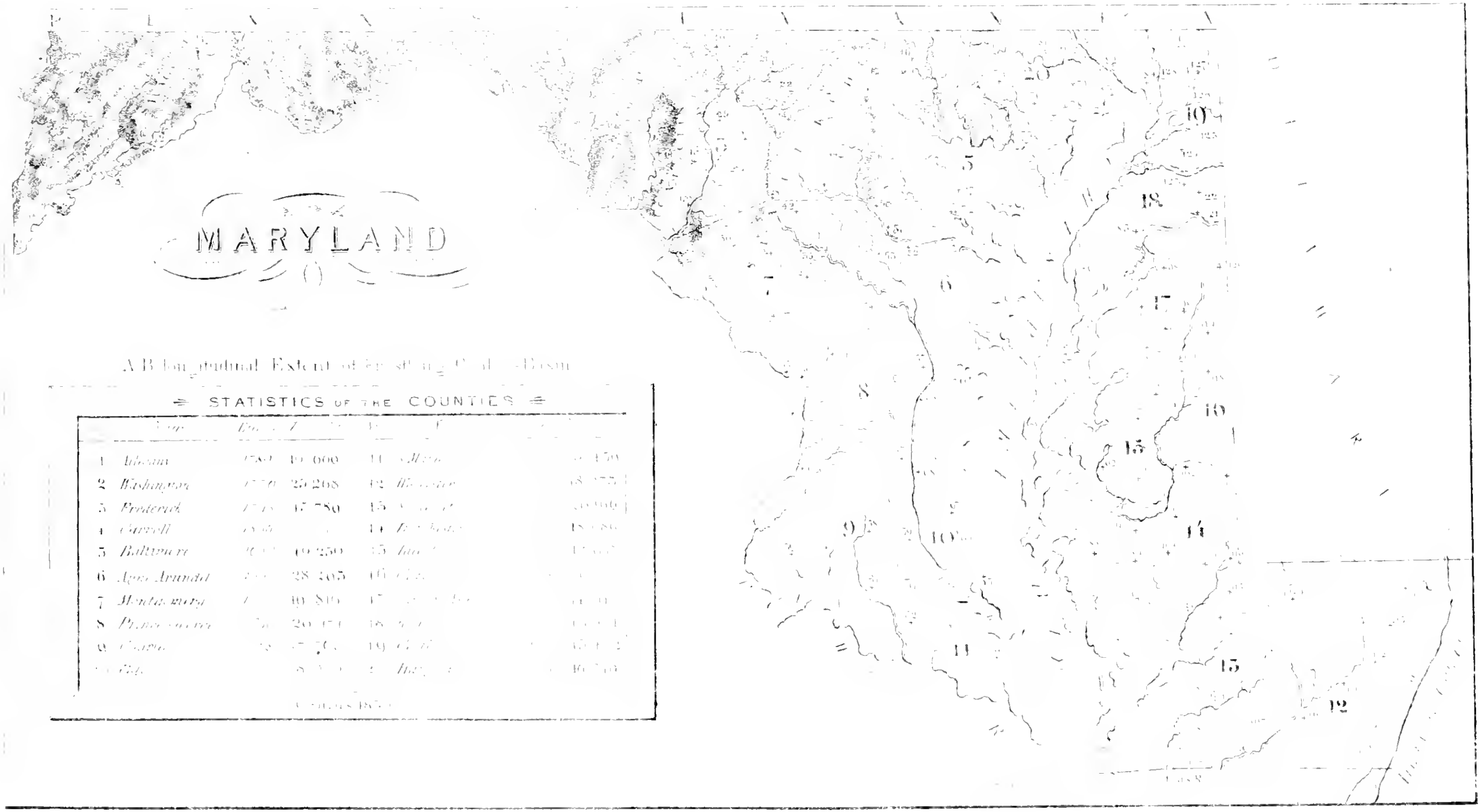
In one locality, near the extreme end of the peninsula, all the fossils have their analogues living either in the waters of the Chesapeake bay or adjacent ocean; whilst in two other localities, one at the edge of the tide, on the Potomac, the other eight feet above it, on the Patuxent, the deposites consist exclusively of the *Ostrea Virginica.*

The upper portions of the great arenaceous and argillaceous formations that have just been described in reference to their fossil contents afford a vast supply of excellent iron-ores, principally composed of carbonate and hydrates of iron. This is also the locality of extensive deposites of fire proof clays, and other aluminous earths used for the manufacture of bricks, of which the beautiful pressed-bricks made in the vicinity of Baltimore are not surpassed by any in the world; whilst the banks of the creeks and rivers furnish the more ordinary clays that are employed for making the various kinds of pottery. The deposite of lignites and pyrites, already referred to as occurring at Cape Sable, on the Magothy, furnishes the material from which large quantities of alum and copperas are annually manufactured for the supply of nearly the whole Union.

On the Eastern Shore, the secondary formation extends to the Chester river, comprising the lower portions of Cecil and nearly the whole of Kent, that portion alone of the latter county forming the eastern neck, and some of the necks of level land in this direction being excepted. The materials of this formation are a highly ferruginous sand, green sand, and micaceous black sand, irregularly deposited, frequently intermixed, in some places uncovered, in others overlaid by gravel, and thick beds of erratic masses consisting principally of hornblende and quartz rocks. The fossils that occur in the green sand are *Terebratulæ* and the *Gryphæa vomer*; in the micaceous black sand, there have been found the *Exogyra*, *Ostrea falcata*, casts of *Cucullæa Mortonii*, fragments of *Ammonites*, the tooth of a saurian reptile, claws of a species of crab, *Lignites*, with other undetermined organic bodies, and in some localities pyrites and crystals of selenite. The tertiary deposites lie south of the Chester river, and do not extend further than the Choptank, inclining in the same direction; so that in the upper portions they are found several feet above tide, whereas, in the lower parts, as in the necks of Talbot county, they appear but little above the water-line. Beyond the Choptank, in Dorchester county, they have been reached at the depth of forty-five feet. At the head of the north-west fork of the Nanticoke, there occurs a fossil deposite, consisting of the *Ostrea Virginica*, *Mytilus hamatus* and *Nassa obsoleta*; and in the vicinity of Easton one composed entirely of *Ostrea Virginica*, deposited in the midst, as it were, of older ones containing numerous species of marine shells. The upper portions of the lowest counties are very sandy and rolling—a succession in fact of sand-hills gently inclining to the south-west and terminating in a level deposite of stiff clay—as if at one time this part of the country had been a sea-beach, from which the waters have receded to a considerable distance beyond the mud-flats that formed at the same period of time, the shallow bottom of the ocean, and extended several miles from her shores. No fossils are known to occur in this direction, the other interesting geological features of which, are embraced in the account of its physical geography.

REFERENCES TO THE MAP OF MARYLAND.

1. Selbysport.
2. Westernport.
3. Frost-town.
4. *Cumberland.*
5. Old Town.
6. Hancock.
7. *Hagerstown.*
8. Williamsport.
9. Funkstown.
10. Boonsboro'.
11. Sharpsburg.
12. Barry.
13. Trap.
14. Middletown.
15. Buckeystown.
16. *Fredericktown.*
17. Creagerstown.
18. Mechanicstown.
19. Graceham.
20. Emittsburg.
21. Taney Town.
22. Union Town.
23. *Westminster.*
24. New Windsor.
25. Woodsboro'.
26. Liberty.
27. Newmarket.
28. Parrsville.
29. Barnestown.
30. Clarksburg.
31. *Rockville.*
32. Brookeville.
33. Triadelphia.
34. Cracklin T.
35. Georgetown.
36. Washington.
37. Piscatawa.
38. *Port Tobacco.*
39. Hilltop.
40. Fort Washington.
41. Bladensburg.
42. Lisbon.
43. Sykesville.
44. Freedom.
45. Manchester.
46. Winbury.
47. Hereford.
48. Reisterstown.
49. Randallstown.
50. Marriottsville.
51. Ellicotts Mills.
52. Elkridge.
53. Savage Factory.
54. Vansville.
55. Q. Anne.
56. *U. Marlboro'.*
57. Nottingham.
58. Brian Town.
59. Benedict.
60. Charlotte Hall.
61. Newport.
62. Chaptico.
63. *Leonard Town.*
64. Great Mills.
65. St. Leonard's.
66. Prince Frederick.
67. Huntingdon.
68. *L. Marlboro'.*
69. Pig-point.
70. London Town,
71. ANNAPOLIS.
72. *Baltimore.*
73. Govanstown.
74. Cooptown.
75. Joppa.
76. *Bel Air.*
77. Abingdon.
78. Bush.
79. Churchville.
80. Darlington.
81. Dublin.
82. Port Deposite.
83. Havre de Grace.
84. Charlestown.
85. *Chestertown.*
86. Rockhall.
87. Sharktown.
88. Church Town.
89. Bucktown.
90. *Cambridge.*
91. Trap.
92. Oxford.
93. *Easton.*
94. Kingston.
95. Williamsburg.
96. Wye Mills.
97. *Centreville.*
98. Church Hill.
99. Bridgetown.
100. Ruthsburg.
101. Hillsboro'.
102. Hunting Creek Town.
103. New Market.
104. Middletown.
105. Vienna.
106. White Haven.
107. Kingston.
108. *Princess Anne.*
109. Salisbury.
110. New Town.
111. *Snowhill.*
112. Newark.
113. Berlin.
114. St. Martin.
115. Quantico.
116. Barren Creek Spring.
117. Federalsburg.
118. Denton.
119. Greensboro'.
120. M. Pleasant.
121. Bridgetown.
122. Massey's Roads.
123. Georgetown.
124. Cecilton.
125. Warwick.
126. French Town.
127. *Elkton.*
128. North East.


MARYLAND
STATISTICS OF THE COUNTIES
Washington
Frederick
Carroll
Baltimore

ARTICLE III.

Catalogue of Phænogamous Plants and Ferns, native or naturalized, growing in the vicinity of Baltimore, Maryland. By William E. A. Aikin, M. D.

[Read before the Academy, March 16, 1837.]

The following catalogue is offered as the beginning of one, which, when complete, will exhibit a sketch of the Flora of Maryland. It has been compiled from notes taken during the herborizing seasons of 1834 and 1835, in Frederick county, and during the season of 1836, in this vicinity. In addition to my own observations, Prof. E. Geddings and Prof. J. T. Ducatel have kindly communicated several species that had escaped my research in this neighbourhood. As it was desirable to make the catalogue an authentic one, nothing has been introduced that has not been seen by one of us, and consequently many omissions remain to be supplied by future explorations. The low grounds of the Eastern Shore and the mountain ridges of Allegany county, each rich in its peculiar vegetation, have been scarcely examined by the botanist, and their contributions when added will, I am persuaded, swell this catalogue to nearly twice its present length. As there appears to be a strange discrepancy among botanical writers as to the authorities for species, it should perhaps be mentioned that the European authors quoted are those given by Kurt. Sprengel, in his sixteenth edition of the Systema Vegetabilium Linnæi; while for American authorities, I have followed Torrey.

Baltimore, March, 1837.

ABBREVIATIONS OF AUTHORS' NAMES.

Ait. Aiton.	Jacq. Jacquin.	S. Sir J. E. Smith.
Bar. Bartram.	Lamb. Lambert.	Sal. Salisbury.
Bk. L. C. Beck.	L'H. L'Heritier.	Scop. Scopoli.
Br. Rob. Brown.	Lind. Lindley.	Sh. Schkuhr.
Bw. Bigelow.	Linn. Linnæus.	Sibth. Sibthorp.
Cates. Catesby.	Moen. Moenchausen.	Sp. Sprengel.
Cav. Cavanilles.	Muhl. Muhlenburg.	Sr. Schreber.
Dec. De Candolle.	Murr. Murray.	Sw. Swartz.
Des. Desfontaines.	Mx. Michaux.	Sz. Schweinitz.
Ehr. Ehrhart.	N. Nuttall.	Tor. Torrey.
Ell. Elliott.	P. Persoon.	Trin. Trinnius.
Gaert. Gaertner.	P. de B. Palisot de Beauv.	Vent. Ventenat.
Gmel. Gmelin.	Ph. Pursh.	Willd. Willdenow.
Hd. Hudson.	Poir. Poiret.	With. Withering.
Hk. Hooker.	Raf. Rafinesque.	Wm. Wangenheim.
Hoffm. Hoffman.	Roem. Roemer & Schultes.	Wr. Walter.

CHARACTERS.

w. White. *r.* Red. *b.* Blue. *y.* Yellow. *g.* Green. *p.* Purple. ⊙ Annual. ♂ Biennial. ♃ Perennial. ♄ Woody. i. inches. ft. feet.

CATALOGUE.

ACALYPHA *virginica*, Linn. Three-seed Mercury. *g*. Ju.—Sept. ☉ 12 i. Road sides.

A. *caroliniana*, Wr. *g*. Ju.—Sept. with the preceding, from which it seems to differ only in the length of the petioles and the broader leaves. Characters too fallacious to be relied upon in this genus. It should constitute only a variety.

ACER *rubrum*, Ehr. Red Maple, Soft Maple. *r*. Mar. ♄ 20—60 ft. Low woods.

A. *dasycarpum*, Ehr. White Maple. *g-y*. Apr. ♄ 50 ft. Banks of streams.

A. *saccharinum*, Linn. Sugar Maple. *g-y*. May. ♄ 50 ft. Woods.

A. *nigrum*, Mx. Black Maple. *y-g*. Ap. ♄ 50 ft. Woods.

A. *striatum*, Mx. Striped Maple. *y-g*. May. ♄ 15 ft. Shaded rocky woods.

A. *spicatum*, Lk. Mountain Maple. *y-g*. May. ♄ 10 ft. With the last.

ACERATES *viridiflora*, Raf. Green Milkweed. *g*. Ju. ♃ 18 i. Sandy fields.

A. *lanceolata*, Ives. *g*. Ju. ♃ 18 i. Only differing from the preceding in the more lanceolate leaf, and as the leaves are extremely variable the species is not tenable.

ACHILLEA *millefolium*, Linn. Yarrow. *y-w*. Ju. ♃ 12 i. Road sides.

ACNIDA *cannabina*, Linn. Water Hemp. *w-g*. Ju. ☉ 3 ft. Along the shores of the bay.

ACONITUM *uncinatum*, Linn. Monkhood. *b*. J. ♃ 2 ft. On the Monocacy.

ACORUS *calamus*, Linn. Sweet Flag. *g-y*. J. ♃ 3 ft. Water, root stomachic.

ACTAEA *rubra*, Willd. Baneberry. *w*. M. ♃ 20 i. Berries red. Shady banks.

A. *alba*, Bw. Necklace weed. *w*. M. ♃ 20 i. Berries white, with the last.

A. *racemosa*, Linn. Black Snake Root. *w*. Ju. ♃ 3—5 ft. Woods.

ACTINOMERIS *squarrosa*, N. Ragged Sunflower. *w-y*. Aug. ♃ 5 ft. Fence corners.

ADIANTUM *pedatum*, Linn. Maiden-hair. J. ♃ 1 ft. Woods.

Æsculus *glabra*, Willd. Little Buckeye. *y-w.* M. ♄ 20 ft. Cultivated.

A. *hippocastanum*, Linn. Horse Chesnut. *y-w.* *r.* J. ♄ 25 ft. Introduced.

Agrimonia *eupatoria*, Linn. Agrimony, *w.* Ju. ♃ 2 ft. Dry woods.

A. *parviflora*, Ait. *w.* Ju. ♃ 18 i. With the last which it closely resembles.

Agropyron *repens*, P. de B. Couch grass. J. ♃ River banks.

Agrostemma *githago*, Linn. Cockle. *r.* J. ☉ Cornfields.

Agrostis *vulgaris*, S. Red top. J. ♃ 18 i.

A. *alba*, Linn. White top, Bonnet grass. J. ♃ 18 i.

A. *lateriflora*, Mx. Au. ♃ 2 ft.

A. *tenuiflora*, Muhl. Ju. ♃ 3 ft.

A. *virginica*, Linn. Aug. ♃ 1 ft.

Aira *flexuosa*, Linn. Hair grass. J. ♃ 18 i.

Aletris *farinosa*, Linn. False Star grass. *y-w.* ♃ 2 ft.

Alisma *plantago*, Linn. Water Plantain. *w.* Ju. ♃ 1—2 ft. In water.

Allium *canadense*, Linn. Meadow Garlic. *r-w.* M. ♃ 18 i. Meadows.

A. *vineale*, Linn. Field Garlic. *r-w.* J. ♃ 18 i. Meadows.

A. *cernuum*, Roth. Nodding Garlic. *r-w.* Ju. ♃ 18 in. On the limestone rocks along the Monocacy.

Alnus *serrulata*, Willd. Alder. *r-g.* Ap. ♄ 15 ft. Swamps.

A. *glutinosa*, Willd. Ap. ♄ 10 ft. Swamps.

Alopecurus *pratensis*, Linn. Foxtail-grass. J. ♃ 2 ft.

A. *geniculatus*, Linn. Floating Foxtail-grass. Ju. ♃ 18 i. Wet meadows.

Amaranthus *albus*, Linn. *g-w.* Ju. ☉ 18 i.

A. *retroflexus*, Linn. *g-w.* Au. ☉ Road sides.

A. *spinosus*, Linn. *g-w.* Au. ☉ Road sides.

A. *lividus*, Linn. *g.* Ju. ☉ Road sides.

Ambrosia *trifida*, Linn Tall Hogweed. *g-y.* Au. ☉ 4—8 ft.

A. *elatior*, Linn. Hogweed. *g-y.* Ju. ☉ 1—3 ft. Old fields.

Ampelopsis *quinquefolia*, Mx. Creeper. *g.* Ju. ♄ Climbing.

Amphicarpa *monoica*, Ell. *b-w.* Ju. ☉ Twining. Damp thickets.

Anagallis *arvensis*, Linn. Scarlet Pimpernel. *r.* J. ☉ 6 i.

Andromeda *mariana*, Linn. *w.* J. ♄ 3—6 ft. Open woods.

A. *polifolia*, Linn. *r-w.* M. ♄ 18 i. Sphagnous swamps.

A. *arborea*, Linn. Sorrel tree. *w.* J. ♄ 40 ft. Eastern Shore.

A. *paniculata*, Ph. White Bush. *w.* J. ♄ 1—3 ft. Dry woods.

A. *racemosa*, Linn. *w.* J. ♄ 2 ft. Swamps.

A. *calyculata*, Linn. *w.* M. ♄ 2 ft. Swamps.

ANDROPOGON *scoparius*, Mx. Broom grass. Au. ♃ 3 ft. Open woods.

A. *virginicus*, Linn. Bent grass. Au. ♃ 2 ft. Old fields.

A. *furcatus*, Muhl. Au. ♃ 2—4 ft. River banks.

A. *nutans*, Linn. Beard Grass. Au. ♃ 3—6 ft. Sandy fields.

ANEMONE *virginiana*, Linn. Wind Flower. *g-w.* Ju. ♃ 18 i. Meadows.

A. *pennsylvanica*, Linn. *w.* J. ♃ 15 i. Meadows. A. *aconitifolia*, Mx.

A. *dichotoma*, Linn. *w.* M. ♃ 1 ft. Woods. Synonymous with A. *pennsylvanica*, Linn.

A. *nemorosa*, var. *quinquefolia*, Dec. Low Anemone. *r-w.* M. ♃ 6 i. Open woods.

A. *thalictroides*, Linn. Rue Anemone. *w.* M. ♃ 6—10 i. Open woods.

ANGELICA *triquinata*, Mx. Angelica. *w.* Au. ♃ 2—4 ft. Dry woods.

A. *atropurpurea*, Linn. *g-w.* Aug. ♃ 3—6 ft. Wet meadows.

ANTHEMIS *arvensis*, Linn. Wild Chamomile. *w-y.* J. ♂ 6—12 i. Old fields.

A. *cotula*, Linn. Mayweed. *w.* J. ☉ 10 i. Road sides. Tonic, vesicatory.

ANTHOXANTHUM *odoratum*, Linn. M. ♃ 12 i. Meadows.

ANTIRRHINUM *elatine*, Desf. Creeping Snapdragon. *b-w.* Ju. ☉ 1—2 ft. Old fields.

A. *linaria*, Linn. Toad Flax. *w. y.* Ju. ♃ 18 i. Road sides.

A. *canadense*, Linn. Flax Snapdragon. *b.* J. ♃ 12 i.

APIOS *tuberosa*, Ph. Ground-nut. *p.* Ju. ♃ Twining. Meadows.

APOCYNUM *androsaemifolium*, Linn. Dog Bane. *r-w.* Ju. ♃ 2—3 ft.

A. *cannabinum*, Linn. Indian Hemp. *g-y.* J. ♃ 3 ft. Open fields.

A. *hypericifolium*, Linn. *g-w.* J. ♃ 3 ft. This and the preceding species (if there are in reality two) have long troubled the botanist. Their close resemblance renders it difficult to find distinctive specific characters.

AQUILEGIA *canadensis*, Linn. Wild Columbine. *r-y.* Ap. ♃ 15 i. Rocks.

ARABIS *sagittata*, Dec. Wall Cress. *w.* J. ☉ ♂ ? 2 ft. Old fields.

A. *thaliana*, Linn. Mouse-ear Cress. *w.* Ju. ☉ 6—12 i. Sandy fields.

A. *levigata*, Dec. *w.* M. ♃ 1—2 ft. Hill sides.

A. *rhomboidea*, P. Spring Cress. *w.* M. ♃ 12 i. Wet woods.

A. *lyrata*, Linn. *w.* Ap. ♂ ♃? 10 i. Point of Rocks, Fred. Co.

A. *canadensis*, Linn. *w.* J. ♃ 1—2 ft. Rocky banks.

ARALIA *spinosa*, Linn. Shot Bush. *y-w.* Au. ♄ 10—15 ft. Rocky woods.

A. *racemosa*, Linn. Spikenard. *w.* J. ♃ 3 ft. Shaded banks.

A. *nudicaulis*, Linn. Wild Sarsaparilla. *w.* M. ♃ 18 i. Woods.

ARCTIUM *lappa*, Linn. Burdock. *r.* Au. ♃ Introduced.

ARENARIA *serpylifolia*, Linn. *w.* J. ⊙ 6 i. Sandy fields.

A. *stricta*, Mx. *w.* M. ♃ 6—12 i. Rocky banks.

A. *lateriflora*, Linn. *w.* J. ♃ 6 i. Wet meadows.

A. *peploides*, Linn. *r-w.* Ju. ♃ 10 in. Shores of the Chesapeake.

A. *canadensis*, P. *r.* J. ⊙ 3—8 i. Brackish meadows. Probably synonymous with A. *rubra* Linn.

ARGEMONE *mexicana*, Linn. Prickly Poppy. *y.* Ju. ⊙ 12 i. Rocky banks of Potomac in Fred. Co.

ARISTIDA *dichotoma*, Mx. Beard grass. Au. ♃ 12 i. Sandy fields.

A. *purpurascens*, Poir. S. ♃ 18 i. Sandy fields.

A. *gracilis*, Ell. S. ♃ 18 i. Approaches the A. *dichotoma* in characters.

ARISTOLOCHIA *serpentaria*, Linn. *p.* J. ♃ 12 i. Rich woods.

ARNICA *nudicaulis*, N. Leopard's Bane. *y.* Ju. ♃ 2—3 ft. Sandy woods.

ARONIA *arbutifolia*, Ell. Red Choke Berry. *w-r.* M. ♄ 3—6 ft. Swamps.

A. *botryapium*, P. June Berry. *w.* Ap. ♄ 8—30 ft. Woods.

A. *melanocarpa*, Tor. *w.* M. ♄ 3—6 ft. Swamps.

ARTEMISIA *canadensis*, Mx. Wild Wormwood. *w-y.* Au. ♃ 3 ft.

ARUM *dracontium*, Linn. Green Dragon. *g.* J. ♃ 18 i. Low banks of streams.

A. *atrorubens*, Ait. Brown Dragon. M. ♃ Wet woods.

A. *triphyllum*, Linn. Indian Turnip. *p-g. w.* M. ♃ 1—3 ft. Wet woods.

ARUNDO *canadensis*, Mx. Reed grass. Au. ♃ 3—4 ft. Low grounds.

A. *coarctata*, Tor. Ju. ♃ 3—5 ft. With the last often in water.

ASARUM *canadense*, Linn. Wild Ginger. *g-p.* M. ♃ 6—12 i. Rich woods. Root strongly aromatic.

ASCLEPIAS *syriaca*, Linn. Milkweed. *w-p.* Ju. ♃ 3—5 ft. Roadsides and waste lots.

A. *obtusifolia*, Mx. *p.* J. ♃ 2 ft. Open woods.

A. *phytolaccoides*, Ph. *w-g.* Ju. ♃ 2—4 ft. Shaded banks.

A. *purpurascens*, Linn. *p.* Ju. ♃ 2 ft. Rocky woods.

A. *variegata*, Linn. *r. r-w. w.* Ju. ♃ 1—2 ft. Open woods.

A. *incarnata*, Linn. *r.* Ju. ♃ 2—4 ft. Banks of streams and wet meadows.

A. *quadrifolia*, Jac. *p-w.* M. ♃ 1—2 ft. Open rocky woods.

A. *verticillata*, Linn. Dwarf Milkweed. *y-g.* Ju. ♃ 1—2 ft. Sandy fields.
A. *angustifolia*, Ell. *g-w.* M. ♃ 18 in. Eastern shore.
Ascyrum *hypericoides*, Linn. *y.* Ju. ♄ 12 i. Sandy barren fields.
A. *amplexicaule*, Mx. *y.* M. ♃ Eastern shore.
A. *cruxandreae*, Linn. Peterswort. *y.* Ju. ♃ Sandy barren fields.
Asparagus *officinalis*, Linn. Asparagus. *y-g.* J. ♃ 2 ft. River banks.
Aspidium *acrostichoides*, Sw. Ju. ♃ 12—18 i. Shady banks.
A. *marginale*, Sw. Ju. ♃ 2—3 ft. Woods.
A. *intermedium*, Willd. Ju. ♃ 1 ft. Woods.
A. *dilatatum*, Sw. Ju. ♃ 1—2 ft. Woods.
A. *bulbiferum*, Sw. Ju. ♃ 18 in. Rocky banks.
A. *asplenioides*, Willd. Ju. ♃ 1 ft. Shady banks.
A. *fragile*, Sw. J. ♃ 6—12 i. Damp rocks. A. *tenue*, Ph.
Asplenium *ebenum*, Ait. Ju. ♃ 6—10 i. Rocky woods.
A. *melanocaulon*, Willd. Ju. ♃ 3—6 i. Rocky woods.
A. *thelypteroides*, Mx. Ju. ♃ 2 ft. Rich woods.
A. *ruta-muraria*, Linn. Ju. ♃ 2 i. On rocks.
A. *rhizophyllum*, Linn. Ju. ♃ 6—10 i. Damp rocky woods.
Aster *rigidus*, Linn. *y-p.* Au. ♃ 1 ft. Dry woods.
A. *solidaginiodes*, Mx. *w.* Au. ♃ 2 ft. Dry woods.
A. *subulatus*, Mx. *y. p.* Au. ♃ 1 ft. Brackish meadows.
A. *tenuifolius*, Linn. *w.* Au. ♃ 18 i. Dry woods.
A. *ericoides*, Linn. *w. y.* Au. ♃ 1—2 ft. Rocky woods.
A. *flexuosus*, N. *y. w-p.* Au. ♃ 1—2 ft. Brackish meadows.
A. *cornifolius*, Willd. *w.* Au. ♃ 18 i. Woods.
A. *humilis*, Willd. *w.* Au. ♄ 1 ft. Pastures.
A. *phlogifolius*, Willd. *w. p.* Au. ♃ 18—24 i. Open dry woods.
A. *undulatus*, Linn. *b. y.* S. ♃ 2—3 ft. Dry woods.
A. *diversifolius*. Linn. *p.* S. ♃ 3 ft. Dry woods.
A. *paniculatus*, Ait. *w. y.* Au. ♃ 2—4 ft. Dry fields.
A. *conyzoides*, Willd. *w.* Ju. ♃ 12—18 i. Woods.
A. *macrophyllus*, Linn. *w. b.* Au. ♃ 18 i. Damp woods.
A. *amplexicaulus*, Willd. *b.* S. ♃ 12—18 i. Dry woods.
A. *prenanthoides*, Willd.? *b.* S. ♃.
A. *mutabilis*, Linn. *p. y.* Au. ♃ 18 i. Woods.
A. *puniceus*, Linn. *b-p.* Aug. ♃ 3—6 ft. Wet woods.
A. *miser*, Linn. *w. b.* S. ♃ 1—2 ft. Dry woods and fields. A very variable species, including among its varieties three species of Aiton, the *A. divergens*, *A. diffusus*, and *A. pendulus*, and perhaps others.
A. *alatus*, (*mihi*) *p. & y.* Ju. ♃ 12—18 i. Damp shady woods. (1)

ASTRAGALUS *carolinianus*, Linn. *w-y*. Ju. ♃ 2—4 ft. Fred. co. west of the Catoctin Mts.

ATRIPLEX *laciniata*, Linn. *g*. J. ☉ 15 i. River shores.

ATROPA *physaloides*, Linn. *w-b*. Ju. ☉ 2—3 ft.

AVENA *præcox*, P. de B. Dwarf oats. J. ☉ 3—10 i. Sandy dry woods.

A. *elatior*, Linn. J. ♃ 3 ft. Open woods. ARRENATHERUM *avenaceum*, P. de B.

AZALEA *nudiflora*, Linn. Early Honeysuckle. *r*. M. ♄ 2—6 ft. Dry woods.

A. *viscosa*, Linn. *w*. J. ♄ 3—5 ft. With the last.

BACCHARIS *halimifolia*, Linn. Groundsel Tree. *w*. S. ♄ Shores of the Patapsco.

BAPTISIA *tinctoria*, Br. Wild Indigo. *y*. Ju. ♃ 2—3 ft. Dry woods.

B. *cærulea*, Mx. *b*. Ju. ♃ 2—4 ft. Banks of the Potomac, Fred. co.

BARBAREA *vulgaris*, Br. Water Radish. *y*. M. ♃ 1—2 ft. Wet meadows.

BATSCHIA *canescens*, Mx. Puccoon. *y*. Ju. ♃ 6—10 i. Hills around Franklin.

BERBERIS *vulgaris*, Linn. Barberry. *y*. M. ♄ 6 ft. Rocky woods.

BETULA *populifolia*, Ait. White Birch. Ju. ♄ 40 ft. Rocky woods.

B. *papyracea*, Ait. Paper Birch. M. ♄ 50 ft. Woods.

B. *lenta*, Linn. Black Birch. M. ♄ 40—80 ft. Low woods.

B *glandulosa*, Mx. Scrub Birch. M. ♄ 4—6 ft. Mountain swamps.

BIDENS *cernua*, Linn. Water Beggar-ticks. *y*. Au. ☉ 1—2 ft. Wet ditches.

B. *chrysanthemoides*, Mx. Daisy Beggar-ticks. *y*. Au. ☉ 12—18 i. Wet.

B. *frondosa*, Linn. Burr Marygold. *y*. Ju. ☉ 3—4 ft. Fence corners.

B. *bipinnata*, Linn. *y*. Ju. ☉ 2—4 ft. Rocky dry woods.

BIGNONIA *radicans*, Linn. Trumpet Creeper. *r. y*. Ju. ♄ Rich alluvial.

BLITUM *virgatum*, Linn. Slender Blite. *r*. J. ☉ 12 i. Fields.

BOEHMERIA *cylindrica*, Willd. False Nettle. *g*. Ju. ♃ 1—3 ft. Damp woods.

BOTRYCHIUM *virginicum*, Swartz. Rattlesnake Fern. J. ♃ 1—2 ft. Damp woods. The *B. gracile*, Ph. evidently a smaller variety of this is often found with it.

BRACHYELYTRUM *erectrum*, P. de B. Ju. ♃ 2—3 ft. Rocky hills.

BROMUS *secalinus*, Linn. Chess. J. ☉ 2—3 ft. Corn fields.

B. *ciliatus*, Linn. J. ♃ 2—3 ft. River banks.

B. *pubescens*, Muhl. Broom grass. J. ♃ 2—4 ft. Woods

B. *mollis*, Linn. J. ♂ 18—24 i. Fields.

Broussonetia, *papyrifera*, Vent. Paper Mulberry. M. ♄ 20—30 ft. Naturalized.

Bupleurum *rotundifolium*, Linn. Seven Stars. *g-y.* J. ☉ 1—2 ft. Naturalized.

Buxus *sempervirens*, Linn. Box. ♄ Cultivated.

Cacalia *atriplicifolia*, Linn. Orache Caraway. *y-w.* Au. ♃ 3—5 ft. Low banks of streams.

Cactus *opuntia*, Linn. Prickly Pear. *y.* J. ♃ Trailing upon dry rocks.

Calendula *officinalis*, Linn. Pot Marygold. *y.* Ju. ☉ 1 ft. Naturalized.

Calla *palustris*, Linn. Water Arum. *g. w.* Ju. ♃ 6—10 i. Water.

Callitriche *verna*, Linn. Water Chickweed. *w.* M. ☉ Water.

Caltha *palustris*, Linn. American Cowslip. *y.* Ap. ♃ 6—12 i. Wet meadows.

Calycanthus *floridus*, Linn. Carolina Allspice. *p.* M. ♄ 6—10 ft.

Campanula *rotundifolia*, Linn. Hare Bell. *b.* J. ♃ 1—2 ft. On rocks.

C. *amplexicaulis*, Mx. *b.* M. ☉ 12—15 i. Dry fields.

C. *americana*, Linn. *b.* Au. ♃ 2—4 ft. Open woods.

C. *aparanoides*, Ph. *b-w.* J. ☉ 1 ft. Damp meadows.

Cannabis *sativa*, Linn. Hemp. *g.* Au. ☉ Waste fields.

Cardamine *pennsylvanica*, Muhl. Water Cress. *w.* M. ♃ 12—18 i. Wet meadows, often in water.

C. *pratensis*, Linn. *r-w.* M. ♃ 6—12 i. With the last, and apparently only a variety.

Cardiospermum *halicacabum*, Linn. Balloon Vine. *y-g.* Au. ☉ Twining.

Carex *cephalophora*, Muhl. M. ♃ 20 i. Open woods.

C. *rosea*, Sh. M. ♃ 6—12 i. Moist.

C. *retroflexa*, Muhl. M. ♃ 12 i. Woods.

C. *stipata*, Muhl. M. ♃ 1—2 ft. Wet places.

C. *multiflora*, Muhl. M. ♃ 20 i. Damp woods.

C. *sparganoides*, Muhl. M. ♃ 1—2 ft. Wet meadows.

C. *scoparia*, Sh. J. ♃ 18 i. Wet meadows.

C. *straminea*, Willd. M. ♃ 18 i. Meadows.

C. *cristata*, Sz. J. ♃ 1—2 ft. Meadows.

C. *stellulata*, Good. M. ♃ 8—12 i. Wet meadows.

C. *scirpoides*, Sh. M. ♃ 8 i. Wet.

C. *acuta*, Linn. M. ♃ 1—2 ft. Wet.

C. *cespitosa*, Linn. M. ♃ 18 i. Banks of streams.

C. *squarrosa*, Linn. M. ♃ 1—2 ft. Wet meadows.

C. *gracillima*, Sz. M. ♃ 18 i. Damp woods.
C. *pubescens*, Muhl. M. ♃ 18 i. Woods.
C. *vestita*, Willd. M. ♃ 1—2 ft. Low grounds.
C. *varia*, Muhl. Ap. ♃ 10 i. Dry woods.
C. *tentaculata*, Muhl. M. ♃ 18 i. Boggy meadows.
C. *folliculata* Linn. M. ♃ 12—18 i. Wet.
C. *lupulina*, Muhl. M. ♃ 2—3 ft. Wet.
C. *anceps*, Muhl. M. ♃ 8—15 i. Dry woods.
C. *conoidea*, Willd. M. ♃ 12 i. Moist woods.
C. *flexuosa*, Muhl. M. ♃ 1—2 ft. Meadows.
C. *hystericina*, Muhl. M. ♃ 20 i. Swamps.
C. *pseudo-cyperus*, Linn. M. ♃ 2 ft. Boggy meadows.
C. *vesicaria*, Linn. M. ♃ 1—2 ft. Swamps.
C. *retrorsa*, Sz. M. ♃ 1—2 ft. Swamps.
C. *pellita*, Muhl. M. ♃ 2 ft. Wet meadows.
C. *lacustris*, Willd. M. ♃ 2—3 ft. Swamps.
C. *crinita*, Lk. M. ♃ 18—24 i. Boggy meadows.
C. *flava*, Linn. M. ♃ 12—18 i. Wet upland.
C. *blanda*, Dewey. M. ♃ 1 ft. Dry woods.
Carpinus *americana*, Mx. Hornbeam. *g*. M. ♄ 20—30 ft. Woods.
Carya *alba*, N. Shag Bark Hickory. *g*. M. ♄ 30—50 ft. Woods.
C. *sulcata*, N. *g*. Ap. ♄ 40—70 ft. Woods.
C. *porcina*, N. Pig Nut. *g*. M. ♄ 60—70 ft. Woods.
Cassia *marilandica*, Linn. Wild Senna. *y*. Au. ♃ 2—4 ft. Meadows and river banks.
C. *chamæcrista*, Linn. Partridge Pea. *y*. Ju. ☉ 12—18 i. Banks of Potomac, Fred. Co.
C. *nictitans*, Linn. Wild Sensitive Plant. *y*. Ju. ☉ 8—12 i. Sandy shores.
Castanea *vesca*, Gaert. Chesnut. *g*. J. ♄ 40—60 ft. Woods.
C. *pumila*, Mx. Chinquapin. *g*. J. ♄ 6—12 ft. Woods.
Catalpa *cordifolia*, Ell. Catalpa. *w*. *y*. *p*. Ju. ♄ 40—50 ft.
Ceanothus *americanus*, Linn. New Jersey Tea. *w*. J. ♄ 2—3 ft. Dry woods.
Celastrus *scandens*, Linn. False Bitter-sweet. *g-y*. M. ♄ Climbing. Banks of streams.
Cenchrus *echinatus*, Linn. Burr Grass. Ju. ☉ 6—12 i. Sandy shores.
Centaurea *benedicta*, Linn. Blessed Thistle. *y*. J. ☉ Naturalized.
C. *cyanus*, Linn. *b*. *w*. *r*. J. ☉ Naturalized.
Cephalanthus *occidentalis*, Linn. Button Bush. *w*. Ju. ♄ 4—8 ft. Borders of swamps.

CERASTIUM *vulgatum*, Linn. *w.* M. ☉ 6—10 i. Fields.

C. *nutans*, Raf. *w.* J. ☉ 6—12 i. Open woods.

C. *oblongifolium*, Tor. *w.* J. ☉ 6—15 i. Rocky banks of the Monocacy.

CERCIS *canadensis*, Linn. Red Bud. *r.* M. ♄ 15—20 ft. Rocky woods.

CHAEROPHYLLUM *procumbens*, Lk. *w.* M. ☉ 6—10 i. Shady places.

CHARA *vulgaris*, Linn. Ju. ☉ Stagnant water.

CHEILANTHES *vestita*, Sw. Lip Fern. Au. ♃ Rocky woods.

CHELIDONIUM *majus*, Linn. Celandine. *y.* M. ♃ 1—3 ft. Road sides.

CHELONE *glabra*, Linn. Snake Head. *w. r.* Ju. ♃ 2—3 ft. Damp meadows.

CHENOPODIUM *album*, Linn. Pig weed. *g.* Ju. ☉ 2—4 ft. Waste grounds.

C. *rubrum*, Linn. *r-g.* Ju. ☉ 2 ft. With the last.

C. *ambrosioides*, Linn. False Worm Seed. *g.* Ju. ☉ 1—2 ft. Road sides.

C. *anthelminticum*, Linn. Wormseed. *g.* Au. ☉ 12—18 i. Road sides.

C. *multifidum*, Linn. *g-w.* J. ☉ 1—2 ft. Stems prostrate. Side-walks and road sides. Introduced.

CHIMAPHILA *maculata*, Ph. *r-w.* Ju. ♃ 4—6 i. Dry woods.

C. *umbellata*, N. *r-w.* Ju. ♃ 4—6 i. Dry woods. Both species are excellent tonic diuretics.

CHIONANTHUS *virginicus*, Linn. Fringe tree. *w.* M. ♄ 10—20 ft. Rocky woods.

CHRYSANTHEMUM *leucanthemum*, Linn. Ox-eye Daisy. *w.* J. ♃ 1—2 ft. Dry fields.

CHRYSOGONUM *virginianum*, Linn. *y.* J. ♃ 6—12 i. Dry woods.

CHRYSOPSIS *mariana*, N. *y.* Au. ♃ 12—18 i. Dry woods.

C. *graminifolia*, N. *y.* S. ♃ Dry woods.

CHRYSOSPLENIUM *oppositifolium*, Linn. *y-r.* M. ♃ Creeping, in water. Our plant is without doubt, as has been already suggested, distinct from the European synonym.

CICUTA *maculata*, Linn. Water Hemlock. *w.* Ju. ♃ 3—5 ft. Swamps.

C. *bulbifera*, Linn. *w.* Ju. ♃ 2—3 ft. Swamps. Both species are active narcotic poisons.

CINNA *arundinacea*, Linn. Au. ♃ 2—4 ft. Damp meadows.

CIRCEA *lutetiana*, var. *canadensis*, Linn. *w.* Ju. ♃ 12—18 i. Damp woods.

C. *alpina*, Linn. *w*. Ju. ♃ 6—10 i. With the last, from which it hardly differs enough to constitute a distinct species.

Cistus *canadensis*, Linn. Rock Rose. *y*. J. ♃ 12 i. Rocky woods.

C *ramuliflorum*, Mx. *y*. Ju. ♃ 10 i.

C. *rosmarinifolium*, Ph. *y*. Ju. ♃ 10 i. The *C. canadensis*, *Linn.* is so extremely variable that I am inclined to consider this and the last as mere varieties of that species.

Claytonia *virginica*, Ait. *r-w*. Ap. ♃ 4—8 i. Damp woods.

Clematis *virginiana*, Linn. Virgin's Bower. *w*. Ju. ♄ Thickets. climbing.

Clethra, *alnifolia*, Linn. Sweet Pepper Bush. *w*. Au. ♄ 4—8 ft. River banks.

Clinopodium *vulgare*, Linn. Wild Thyme. *r-w*. Ju. ♃ 12—18 i. Dry meadows.

Clitoria *mariana*, Linn. Butterfly-weed. *b*. Ju. ♃ Climbing. Sandy banks of streams.

Cnicus *lanceolatus*, Hoffm. Thistle. *p*. J. ♂ 2—4 ft. Road sides.

C. *altissimus*, Willd. *w-p*. Ju. ♃ 3—8 ft. Damp thickets.

C. *arvensis*, Hoffm. Canada Thistle. *p*. Ju. ♃ 2—3 ft. Cultivated fields.

C. *odoratus*, Muhl. *p*. Ju. ♂ 1—2 ft. Dry woods.

C. *virginianus*, Ph. *p*. Ju. ♃ 2—3 ft. Woods.

Cnidium *atropurpureum*, Sp. *p*. J. ♃ 2—3 ft. Rocky woods.

Cochlearia *armoracia*, Linn. Horse Radish. *w*. J. ♃ 2 ft. Waste grounds.

Collinsonia *canadensis*, Linn. Horse Balm. *y*. Ju. ♃ 2—4 ft. Woods.

Commelina *augustifolia*, Mx. Day-flower. *b*. Ju. ♃ Rocky banks of Potomac.

Comptonia *asplenifolia*, Ait. Sweet Fern. *g*. Ap. ♄ 1—3 ft. Woods.

Conium *maculatum*, Linn. Poison Hemlock. *w*. Ju. ♃ 2—4 ft. Meadows. Poisonous.

Convallaria *bifolia*, Linn. *w*. M. ♃ 4—6 i. Shady Woods.

C. *stellata*, Linn. *w*. M. ♃ 8—18 i. Dry meadows.

C. *racemosa*, Linn. Solomon's Seal. *y-w*. M. ♃ 1—2 ft. Woods.

C. *multiflora*, Linn. *w-g*. Ju. ♃ 2—4 ft. Meadows.

C. *pubescens*, Willd. *g-w*. M. ♃ 12—18 i. Dry woods.

C. *biflora*, Wr. *g-y*. M. ♃ 12—18 i. Rocky woods.

C. *majalis*, Linn. Lily of the valley. *w*. J. ♃ 6 i. Mountain woods.

Convolvulus *repens*, Vahl. Wild morning-glory. *w. p.* J. ♃ Climbing. Thickets and banks of streams.

C. *panduratus*, Linn. Mechoacan. Man of the Earth. *w. r.* Ju. ♃ Trailing. Dry fields.

C. *spithamæus*, Linn. *w.* J. ♃ 9—12 i. Dry fields.

C. *batatus*, Linn. Sweet potato. *w.* Jn. ♃ Trailing. Sandy fields.

C. *purpureus*, Linn. Morning-glory. *p. w. r.* J. ☉ Naturalized.

Conyza *marylandica*, Mx. Plowman's-wort. *p.* Au. 1—2 ft. Swampy shores.

C. *camphorata*, Ph. *p.* Au. ♃ 3 ft. Is this distinct from the preceding?

Coptis *trifolia*, Sy. Gold Thread. *w.* M. ♃ 2—4 i. Swamps.

Corallorhiza *verna*, N. *w-y.* M. ♃ 5—6 i. Dry woods.

C. *multiflora*, N. *p.* Au. ♃ 8—18 i. Dry woods.

Coreopsis *lanceolata*, Linn. *y.* S. ♃ Low grounds.

Cornus *florida*, Linn. Dog-wood. *w. y.* M. ♄ 15—30 ft. Woods. Drupe scarlet.

C. *sericea*, L'h. *w.* J. ♄ 8—12 ft. Banks of streams. Drupe blue.

C. *alba*, Linn. *w.* J. ♄ 10 ft. Drupe white.

C. *paniculata*, L'h. *w.* Ju. ♄ 6—12 ft. Banks of streams. Drupe white.

Corydalis *glauca*, Ph. *g-y r.* M. ☉ 12—18 i. Rich open woods.

C. *aurea*, Willd. *y.* M. ☉ 8—12 i. Rich meadows.

Corylus *americana*, Wr. Hazle-nut. Ap. ♄ 4—8 ft. Woods.

Crataegus *coccinea*, Linn. Thorn. *w.* M. ♄ 6—10 ft. Woods. Fruit red.

C. *punctata*, Ait. *w.* M. ♄ 10—30 ft. Woods. Fruit red and yellow.

C. *crus-galli*, Ait. *w.* M. ♄ 10—15 ft. Woods. Fruit red.

C. *oxycantha*, Linn. Hawthorn. *w.* J. ♄ 8—10 ft. Hedges. Fruit red. Naturalized.

Crotalaria *sagittalis*, Linn. Rattle-box. *y.* Ju. ☉ 8—12 i. Sandy woods.

Cryptotænia *canadensis*, Dec. *w.* J. ♃ 1—2 ft. Damp woods.

Cucubalus *stellatus*, Linn. *w.* Ju. ♃ 2—3 ft. Dry woods.

Cunila *mariana*, Linn. Dittany. *r-b.* Ju. ♃ 8—12 i. Dry woods.

Cuphea *viscosissima*, Jacq. Wax Bush. *p.* J. ☉ 6—18 i. Dry hills.

Cupressus *thuyoides*, Linn. White Cedar. M. ♄ 40—50 ft. Swamps.

C. *disticha*, Linn. Cypress. M. ♄ 60—80 ft. Swamps.

CUSCUTA *americana*, Linn. Dodder. *w.* Au. ☉ A twining parasite on plants in damp shady places.

CYMBIDIUM *pulchellum*, Ph. Grass Pink. *p.* Ju. ♃ 12—18 i. Swamps.

CYNOGLOSSUM *officinale*, Linn. Hound's Tongue. Tory weed. *p.* J. ♂ 1—2 ft. Road sides.

C. *amplexicaule*, Mx. *w. b.* J. ♃ 12—18 i. Rocky woods.

CYPERUS *flavescens*, Linn. Au. ♃ 6—8 i. Wet.

C. *phymatodes*, Muhl. Au. ♃ 12—18 i. Low grounds.

C. *mariscoides*, Ell. Au. ♃ 10 i. Sandy fields.

C. *strigosus*, Linn. Au. ♃ 2—3 ft. Wet.

CYPRIPEDIUM *parviflorum*, Sw. *g-y.* M. ♃ 12—18 i. Rocky woods.

C. *pubescens*, Willd. Yellow Ladies' Slipper. *y.* M. 12—18 i. Woods.

C. *spectabile*, Sw. *w. p.* J. ♃ 2—3 ft. Swamps.

C. *acaule*, Ait. *p.* M. ♃ 1 ft. Damp woods.

DACTYLIS *glomerata*, Linn. Orchard grass. J. ♃ 2—3 ft. Meadows.

DANTHONIA *spicata*, N. Wild Oats. Ju. ♃ Dry woods.

DATURA *stramonium*, Linn. Thorn Apple. *w-b.* Au. ☉ 2—4 ft. Waste grounds.

D. *tatula*, Linn. *p-w.* Ju. ☉ 2—4 ft. Waste grounds. A variety of the preceding.

DAUCUS *carota*, Linn. Carrot. *w.* J. ♂ 2—3 ft. Road sides.

DELPHINIUM *exaltatum*, Ait. Wild Larkspur. *b.* Ju. ♃ 2—4 ft. Rocky woods.

D. *consolidum*, Linn. Larkspur. *b. w. r.* Ju. ☉ 1—2 ft. Naturalized.

DENTARIA *diphylla*, Mx. Pepper root. *w.* M. ♃ 6—8 i. Wet woods.

D. *laciniata*, Muhl. *r-w.* M. ♃ 8 i. Wet meadows.

DESMODIUM *marylandicum*, Dec. *p.* Ju. ♃ 2—4 ft. Banks of streams.

D. *ciliare*, Dec. *p.* Au. ♃ 1—2 ft. Woods.

D. *viridiflorum*, Bk. *g-p.* Ju. ♃ 2—4 ft. Rocky woods.

D. *obtusum*, Dec. *p.* Ju. ♃ 2—3 ft. Woods.

D. *paniculatum*, Dec. *p.* Au. ♃ 2—3 ft. Woods.

D. *strictum*, Dec. *p.* Ju. ♃ 1—3 ft. Sandy woods.

D. *nudiflorum*, Dec. *p.* Ju. ♃ Scape 1—2 ft. Woods.

D. *acuminatum*, Dec. *p.* Ju. ♃ 2—3 ft. Woods.

DICLYTRA *cucullaria*, Dec. *y-w.* M. ♃ 6—8 i. Shady river bottoms.

D. *canadensis*, Dec. *y-w.* M. ♃ 6—8 in. With the preceding.

DIERVILLA *canadensis*, Willd. Bush honeysuckle. *r-y*. J. ♄ 2—4 ft. Open woods.

DIGITARIA *sanguinalis*, P. Au. ☉ 1—2 ft. Road sides.

D. *filiformis*, Ell. Au. ☉ 12—18 i. Rocky woods.

DIOSCOREA *villosa*, Linn. Yam Root. *g-w*. J. ♃ Twining. Damp woods.

D. *quaternata*, Wr. *g-w*. J. ♃ Twining, with the preceding.

DIOSPYROS *virginiana*, Linn. Persimmon. *y-w*. M. ♄ 15—25 ft. Woods.

DIPSACUS *sylvestris*, Mill. Wild Teasel. *b*. Ju. ♂ 2—4 ft. Road sides.

DIRCA *palustris*, Linn. Leather-wood. *y*. Ap. ♄ 2—4 ft. Swamps.

DISCOPLEURA *capillacea*, Dec. *w*. Au. ☉ 10—18 i. Wet grounds.

DODECATHEON *meadia*, Linn. *p*. M. ♃ 8—12 i. Eastern Shore.

DROSERA *rotundifolia*, Linn. Sun-dew. *y-w*. Ju. ♃ 4—8 i. Sphagnous swamps.

DULICHIUM *spathaceum*, P. *y-g*. Ju. ♃ 12—18 i. Swamps.

ECHIUM *vulgare*, Linn. Blue Thistle. *b*. J. ♂ 2—3 ft. Road sides.

ECLIPTA *procumbens*, Mx. *w*. J. ☉ 1—3 ft. Low banks of the Potomac.

ELEPHANTOPUS *carolinianus*, Willd. *p*. Au. ♃ 2 ft. Dry sandy fields.

ELEUSINE *indica*, Lk. Wire grass. Ju. ☉ 6—12 i. Road sides.

ELYMUS *virginicus*, Linn. Wild Rye. Ju. ♃ 2—4 ft. Open woods.

E. *villosus*, Muhl. Lime-grass. Ju. ♃ 2—3 ft. River banks.

E. *hystrix*, Linn. Ju. ♃ 2—3 ft. Rocky woods.

EPIGEA *repens*, Linn. Trailing Arbutus. *r-w*. Ap. ♄ Creeping. Open woods.

EPILOBIUM *lineare*, Muhl. *r-w*. Ju. ♃ 1—2 ft. Wet meadows.

E. *coloratum*, Muhl. *r-p*. Ju. ♃ 2—3 ft. Wet meadows.

EPIPHEGUS *americanus*, N. Beech Drops. *p-y*. Ju. ♃ 8—12 i. Woods. Parasitic.

EQUISETUM *arvense*, Linn. Horsetail. Ap. ♃ 6—8 i. Wet grounds.

E. *hyemale*, Linn. Scouring Rush. J. ♃ 1—3 ft. Low woods.

E. *sylvaticum*, Linn. Ap. ♃ 12—18 i. Wet meadows.

ERIGERON *bellidifolium*, Willd. *p*. M. ♃ 1—2 ft. Open woods.

E. *purpureum*, Ait. *p*. Ju. ♃ 1—2 ft. Dry woods.

E. *philadelphicum*, Lour. *w-p*. Au. ♃ 1—3 ft. Open woods.

E. *strigosum*, Willd. *w*. Ju. ♂ 2—3 ft. Meadows.

E. *canadense*, Linn. Flea-bane. *w*. Ju. ☉ 6 i.—6 ft. Dry fields. Some authors make a distinct species of the small variety.

ERIOCAULON *pellucidum*, Mx. Pipe-wort. *g*. Au. ♃ 6—12 i. Water.

Eriophorum *polystachyon*, S. Cotton-grass. Ju. ♃ 18—24 i. Swamps.

E. *virginicum*, Linn. J. ♃ 1—3 ft. Swamps.

Erophila *vulgaris*, Dec. Whitlow-grass. *w.* Ap. ☉ 1—6 i. Fields.

Erythronium *americanum*, S. Adder's-tongue. *y.* Ap. ♃ 6—10 i. Moist woods.

Euchroma *coccinea*, N. Painted-cup. *w. r.* M. ♃ 8—12 i. Wet grounds.

Euonymus *atropurpureus*, Jacq. *p.* J. ♄ 4—8 ft. Damp woods.

E. *americanus*, Linn. Spindle Tree. *r-y.* J. ♄ 4—6 ft. Damp woods,

Eupatorium *sessilifolium*, Linn. *w.* Au. ♃ 2—3 ft. Rocky woods.

E. *verbenæfolium*, Mx. *w.* Au. ♃ 2 ft. Low grounds.

E. *trifoliatum*, Linn. *p.* Au. ♃ 3—4 ft. Low grounds.

E. *purpureum*, Linn. Queen of the Meadow. *p.* Au. ♃ 4—6 ft. Wet meadows.

E. *verticillatum*, Willd. *w-p.* Au. ♃ 4—6 ft. Meadows.

E *perfoliatum*, Linn. Boneset. Thorough-wort. *w.* Au. ♃ 1—3 ft. Wet meadows.

E. *cœlestinum*, Linn. *b.* Au. ♃ 1—3 ft. Banks of streams.

E. *aromaticum*, Linn. *w.* Au. ♃ 2 ft. Rocky woods.

E. *ageratoides*, Linn. *w.* Au. ♃ 2—3 ft. Rocky woods.

Euphorbia *corollata*, Linn. *w.* Ju. ♃ 10—30 i. Dry fields.

E. *Eatonii*, (mihi.) *w-g.* M. ☉ ? 12—18 i. Sandy meadows. (2.)

E. *hypericifolia*, Linn. Ju. ☉ 12—18 i. Waste grounds.

E. *maculata*, Linn. Ju. ☉ 6—12 i. Dry fields.

E. *polygonifolia*, Linn. Ju. ♃ 6—8 i. Sandy banks of Patapsco.

Fagus *ferruginea*, Ait. Red Beech. *y-w.* M. ♄ 40—60 ft. Woods.

F. *sylvatica*, Linn. White Beech. *y-w.* M. ♄ 50—80 ft. Woods.

Festuca *tenella*, Willd. J. ☉ 8—15 i. Dry rocky woods.

F. *pratensis*, Hd. J. ♃ 1—2 ft. Meadows.

F. *nutans*, Muhl. J. ♃ 2—3 ft. Damp woods.

Ficus *carica*, Linn. Fig-tree. *g.* Ju. ♄ 5—10 ft. Naturalized.

Fragaria *virginiana*, Ehr. Wild Strawberry. *w.* M. ♃ Dry fields.

F. *canadensis*, Mx. *w.* M. ♃ Meadows.

Fraxinus *sambucifolia*, Lk. Black Ash. M. ♄ 30—40 ft. Low grounds.

F. *acuminata*, Lk. White Ash. M. ♄ 40—60 ft. Woods.

F. *juglandifolia*, Lk. Swamp Ash. M. ♄ 20—30 ft. Wet woods.

Galeopsis *tetrahit*, Linn. Flowering nettle. *r. w.* ☉ 1—2 ft. Old fields.

Galium *trifidum*, Linn. *w.* Ju. ♃ 6—12 i. Wet meadows.

G. *tinctorium*, Linn. Wild Madder. *w.* J. ♃ 1 ft. Wet woods.
G. *brachiatum*, Ph. *w.* Ju. ♃ 2—3 ft. Meadows.
G. *aparine*, Linn. *w.* J. ♂ 3—4 ft. Damp woods and thickets.
G. *triflorum*, Mx. *w.* Ju. ♃ 1—2 ft. Damp woods and thickets.
G. *circæzans*, Mx. Wild Liquorice. *p.* J. ♃ 6—12 i. Dry woods.
G. *lanceolatum*, Tor. *p.* Ju. ♃ 12—18 i. Dry woods.
GAULTHERIA *procumbens*, Linn. Wintergreen. *w.* M. ♃ 4—8 i. Rocky woods.
GAURA *biennis*, Linn. *r. y.* Au. ♂ 3—6 ft. River banks.
GENTIANA *saponaria*, Linn. *b. w.* S. 1—2 ft. Meadows.
G. *quinqueflora*, Lk. *w-b.* Au. ♂ 12—18 i. Wet open woods.
G. *crinita*, Frol. Fringed Gentian. *b.* S. ♃ 1—2 ft. Swampy woods.
GERANIUM *maculatum*, Linn. Crane's-bill. *p.* J. ♃ 1—2 ft. Fields and open woods.
G. *carolinianum*, Linn. *w-r.* Ju. ♂ 1—2 ft. Rocky fields.
G. *pusillum*, Linn. *b.* M. ☉ 12—18 i. Rocky damp woods.
G. *dissectum*, Linn. *r.* J. ☉ 3—12 in. Rocky open woods.
G. *robertianum*, Linn. *r.* J. ☉ 10—15 i. Rocky banks.
GERARDIA *flava*, Linn. False Foxglove. *y.* Ju. ♃ 2—4 ft. Dry woods.
G. *glauca*, Eddy. *y.* Ju. ♃ 3—5 ft. Open woods.
G. *purpurea*, Linn. *p.* Au. ☉ 6—18 i. River meadows.
G. *tenuifolia*, Vahl. *p.* Au. ☉ 6—12 i. Dry woods.
G. *pedicularia*, Linn. *y.* Au. ♃ 2 ft. Point of Rocks.
GEUM *strictum*, Ait. *y.* J. ♃ 2 ft. Swamps.
G. *virginianum*, Linn. *w.* Ju. ♃ 2 ft. Damp woods.
G. *album*, Gmel. *w.* Ju. ♃ 2 ft. Swampy woods.
G. *rivale*, Willd. *p. y.* ♃ M. 1—2 ft. Swamps.
GILLENIA *trifoliata*, Moen. Indian Physic. *w.* J. ♃ 2—3 ft. Rocky banks.
GLAUCIUM *luteum*. Scop. Horned Poppy. *y.* Ju. ☉ 1—2 ft. Rocky banks of Potomac.
GLECHOMA *hederacea*, Linn. Ground Ivy. *b. r.* M. ♃ 6 i. Stem prostrate. Meadows.
GLEDITSCHIA *triacanthos*, Linn. *y-g.* J. ♄ 40—50 ft. Cultivated.
GLYCERIA *fluitans*, Br. Ju. ♃ 2—3 ft. Wet places in meadows.
G. *acutiflora*, Tor. J. ♃ 2—3 ft. With the preceding.
GNAPHALIUM *polycephalum*, Mx. *y-w.* Ju. ☉ 1—2 ft. Fields.
G. *decurrens*, Ives. *y-w.* Ju. ☉ 1—2 ft. Road sides.
G. *purpureum*, Linn. *p.* Ju. ♃ 6—12 i. Rocky woods.
G. *uliginosum*, Linn. *y-w.* Ju. ☉ 4—8 i. Muddy ditches.

G. *germanicum*, S. *w.* Ju. ☉ 6—12 i. Dry hills.

G. *margaritaceum*, Linn. *w-y.* Ju. ♃ 1—2 ft. Dry hills.

G. *plantagineum*, Linn. Mouse-ear. *r-w.* Ap. ♃ 4—10 i. Woods and fields.

Gonolobus *hirsutus*, Mx. *p.* Ju. ♃ Twining. Damp thickets.

Goodyera *pubescens*, Br. *y-w.* Ju. ♃ 12—18 i. Rich woods.

Gratiola *virginica*, Linn. *y-w.* Ju. ♃ 6—8 i. Wet meadows.

Habenaria *ciliaris*, Br. *y.* Ju. ♃ 1—2 ft. Upland swampy meadows.

H. *dilatata*, Hk. *g. w.* J. ♃ 1—3 ft. Damp woods and meadows.

H. *bracteata*, Br. *g-w.* M. ♃ 6—12 i. Shady damp woods.

H. *fimbriata*, Br. *p.* Ju. ♃ 1—2 ft. Wet meadows.

Hamamelis *virginica*, Linn. *y.* Oct. ♄ 6—12 ft. Open woods.

Hedeoma *pulegioides*, P. Pennyroyal. *p.* J. ☉ 6—12 i. Dry hills.

Hedera *helix*, Linn. English Ivy. *g-w.* S. ♃ Stem rooting. On trees in wet woods.

Helenium *autumnale*, Linn. *y.* Au. ♃ 3—5 ft. Banks of streams.

Helianthus *frondosus*, Linn. *y.* Ju. ♃ 3—4 ft. Dry woods.

H. *trachelifolius*, Willd. *y.* Au. ♃ 2—4 ft. Dry woods.

H. *angustifolius*, Linn. *y. p.* Au. ♃ 2—5 ft. Upland swamps.

H. *strumosus*, Linn. *y.* Au. ♃ 3—5 ft. Dry woods.

H. *altissimus*, Linn. *y.* Ju. ♃ 4—8 ft. Low grounds and swamps.

H. *decapetalus*, Linn. *y.* Au. ♃ 3—4 ft. Dry woods.

H. *macrophyllus*, Willd. *y.* Au. ♃ 2—4 ft. Dry woods. Synonym of the last?

Heliopsis *lævis*, P. *y.* Ju. ♃ 3—5 ft. Low grounds.

Heliotropium *europeum*, Linn. *w.* Ju. ☉ 6—15 i. Rocky fields, near Point of Rocks.

Helonias *dioica*, Ph. *w.* J. ♃ 1—2 ft. Rich woods and meadows.

Hemerocallis *fulva*, Linn. Day Lily. *y.* Ju. ♃ 2—3 ft. Naturalized.

Hepatica *acutiloba*, Dec. *w. b.* Ap. ♃ 3—6 i. Woods.

H. *americana*, Dec. *w. b. p.* Ap. ♃ 3—6 i. Woods. Mere varieties of H. *triloba*, Willd.

Heracleum *lanatum*, Mx. Cow Parsnip. *w.* J. ♃ 3—5 ft. Meadows.

Hesperis *matronalis*, Linn. Garden Rocket. *w.* Ju. ♃ Naturalized.

Heuchera *americana*, Linn. *r.* Ju. ♃ 2—3 ft Rocky woods.

H. *pubescens*, Ph. *r. y.* J. ♃ 2 ft. Rocky woods and banks.

Hibiscus *moscheutos*, Linn. *w. p.* Au. ♃ 2—5 ft. River swamps.

H. *palustris*, Linn. *p.* Au. ♃ 2—5 ft. River swamps. Undoubtedly synonymous with the preceding, as the position of the peduncle and the form of the leaf is not constant, *even in the same specimen.*

H. *trionum*, Linn. Flower of an hour. *y-w. and p.* Ju. ☉ 1—2 ft. Cultivated fields. Naturalized.

HIERACIUM *gronovii*, Linn. *y.* Ju. ♃ 1—2 ft. Dry woods.

H. *venosum*, Linn. *y.* Ju. ♃ 1—2 ft. Dry woods. Having never been able to find this plant with a glabrous or even smooth calyx, and a uniformly leafless scape, which are considered as the distinguishing characteristics, I am more confirmed in the opinion, published many years since, that it is a mere stemless variety of the preceding extremely variable species.

H. *paniculatum*, Linn. *y.* Ju. ♃ 1—2 ft. Dry woods.

H. *marianum*, Willd. *y.* Ju. ♃ 18—24 i. Dry woods.

HOLCUS *lanatus*, Linn. J. ♃ 1—2 ft. Swampy meadows.

HOUSTONIA *cœrulea*, Linn. *b. w.* M. ♃ 4—6 i. Dry fields.

H. *longifolia*, Willd. *p.* J. ♃ 6—12 i. Dry woods.

H. *purpurea*, Linn. *p.* Ju. ♃ 6—12 i. Banks of streams.

HUMULUS *lupulus*, Linn. Hop. *g-y.* Au. ♃ Twining. Hedges.

HYDRASTIS *canadensis*, Linn. *r-w.* Ap. ♃ 6—8 i. Rocky woods.

HYDROCOTYLE *americana*, Linn. *g-w.* J. ♃ 4—6 i. Damp woods.

HYDROPELTIS *purpurea*, Mx. *p.* Ju. ♃ Ponds.

HYDROPHYLLUM *virginicum*, Linn. *w. b.* J. ♃ 1—2 ft. Shady damp woods.

H. *canadense*, Linn. *b. w.* J. ♃ 1—2 ft. With the last.

HYOSCIAMUS *niger*, Linn. Henbane. *y. p.* Ju. ♂ 1—2 ft. Road sides.

HYPERICUM *prolificum*, Linn. *y.* J. ♄ 1—3 ft. Banks of streams.

H. *perforatum*, Linn. St. John's-wort. *y.* J. ♃ 1—2 ft. Road sides.

H. *corymbosum*, Willd. *y.* J. ♃ 1—2 ft. Swamps and wet woods.

H. *parviflorum*, Willd. *y.* J. ♃ 6—12 i. Low grounds.

H. *canadense*, Linn. *y.* J. ☉ 9—18 i. Fields.

H. *virginicum*, Linn. *y-p.* Ju. ♃ 1—2 ft. Bog meadows.

H. *sarothra*, Mx. *y.* J. ♃ 3—6 i. Sandy fields. SAROTHRA *gentianoides*, Willd.

HYPOXIS *erecta*, Linn. Star-grass. *y.* J. ♃ 6—12 i. Woods.

HYSSOPUS *nepetoides*, Linn. *g-y. & g-p.* Ju. ♃ 3—6 ft. Woods.

H. *scrophularifolius*, Willd. *p.* Ju. ♃ 3—5 ft. With the last, closely resembling it, and very probably a mere variety, as the form of the leaf cannot be relied upon, neither can the length of the style as this increases in length as the flower approaches maturity.

Ictodes *fœtida*, Bw. Skunk Cabbage. *p. g.* Ap. ♃ Swampy meadows.

Ilex *opaca*, Ait. Evergreen Holly. *g-w.* M. ♄ 20 ft. Wet woods.

Impatiens *pallida*, N. *y.* Ju. ☉ 2—4 ft. Wet grounds.

I. *fulva*, N. Touch-me-not. *y. spotted.* Ju. ☉ 2—4 ft. Wet grounds.

Inula *helenium*, Linn. Elecampane. *y.* Au. ♃ 3—5 ft. Road sides.

Ipomea *lacunosa*, Linn. *w. p.* J. ☉ Twining. Low banks of Potomac.

I. *nil*, Ph. Morning Glory. *b. w. r.* Ju. ☉ Twining. Banks of Potomac.

Iris *versicolor*, Linn. Blue Flag. *b.* J. ♃ 1—3 ft. Swamps.

I. *prismatica*, Ph. *b.* J. ♃ 1—2 ft. Margin of streams.

Isanthus *cœruleus*, Mx. *w-b.* Ju. ☉ 6—12 i. Gravelly shores and fields.

Isnardia *palustris*, Linn. *g.* J. ♃ Prostrate. Stagnant water.

Iva *frutescens*, Linn. *g.* Au. ♄ 2—4 ft. Shores of Patapsco.

Juglans *nigra*, Linn. Black Walnut. M. ♄ 40—50 ft. Rich woods.

J. *cineria*, Linn. Butter-nut. M. ♄ 40—50 ft. Rich woods.

Juncus *effusus*, Linn. J. ♃ 2—3 ft. Wet grounds.

J. *tenuis*, Willd. Ju. ♃ 1 ft. Road sides.

J. *nodosus*, Muhl. Ju. ♃ 6—12 i. Swampy grounds.

J. *bufonius*, Linn. Ju. ☉ 4—8 i. Moist ditches.

J. *polycephalus*, Mx. Ju. ♃ 1—2 ft. Boggy meadows.

J. *acuminatus*, Mx. Ju. ♃ 12—18 i. Bog meadows.

Juniperus *communis*, Linn. Juniper. *g.* M. ♄ 5—10 ft. Rocky banks.

J. *virginiana*, Linn. Red Cedar. *y-g.* M. ♄ 20—50 ft. Rocky woods.

Justicia *pedunculosa*, Mx. *p.* Ju. ♄ 1—3 ft. Water.

Kalmia *latifolia*, Linn. Laurel. *w. r.* J. ♄ 3—20 ft. Woods.

K. *augustifolia*, Linn. Sheep Laurel. *r.* J. ♄ 2—4 ft. Dry woods.

Koeleria *pennsylvanica*, Dec. J. ♃ 18—24 i. Rocky woods.

K. *truncata*, Tor. J. ♃ 1—2 ft. Rocky woods.

Krigia *virginica*, Willd. *y.* M. ☉ 4—8 i. Sandy fields.

K. *amplexicaulis*, N. *y.* Ju. ♃ 12—14 i. Open rocky woods.

Kuhnia *eupatoroides*, Linn. False Boneset. *w.* Au. ♃ 2—3 ft. Open woods, near North Point.

Lactuca *elongata*, Muhl. *y.* J. ♂ 3—6 ft. Fields.

Lamium *amplexicaule*, Linn. *r. p.* M. ☉ 6—10 i. Road sides.

Laurus *benzoin*, Linn. Spice bush. *g-y.* Ap. ♄ 4—10 ft. Swamps.
L. *sassafras*, Linn. Sassafras. *y.* M. ♄ 10—40 ft. Banks of streams.
L. *carolinensis*, Cates. *y.* J. ♄ 10—30 ft. Eastern shore. *v. s.*
Lechea *minor*, Linn. *g-p.* Ju. ♃ 5—12 i. Dry rocky woods.
Leersia *virginica*, Willd. Ju. ♃ 2—3 ft. Wet meadows.
L. *oryzoides*, Sw. Ju. ♃ 2—4 ft. Swamps.
Lemna *trisulca*, Linn. Ju. ☉ Water in ditches.
L. *gibba*, Linn. J. ☉ Stagnant water.
L. *polyrrhiza*, Linn. Ju. ☉ Stagnant water.
Leontice *thalictroides*, Linn. *g-y.* M. ♃ 1—2 ft. Rich woods.
Leontodon *taraxacum*, Linn. Dandelion. *y.* Ap. ♃ Fields.
Leonurus *cardiaca*, Linn. Motherwort. *w. r.* Ju. ♃ 2—3 ft. Old fields.
Lepidium *virginicum*, Linn. Wild Pepper-grass. *w.* J. ☉ 1 ft. Road sides.
L. *campestre*, Br. *y.* J. ☉ 1—2 ft. Cultivated fields.
Leptandra *virginica*, N. *w.* Ju. ♃ 2—4 ft. Dry meadows.
Lespedeza *capitata*, Mx. *w-p.* J. ♃ 2—3 ft. Bushy fields.
L. *augustifolia*, Ell. *w-p.* Au. ♃ 2—3 ft. Rocky woods.
L. *polystachia*, Mx. *r-w.* Ju. ♃ 2—4 ft. Dry woods.
L. *sessiliflora*, Mx. *r-p.* Ju. ♃ 1—2 ft. Dry woods.
L. *violacea*, P. *r-p.* Ju. ♃ 1—2 ft. Dry woods.
L. *divergens*, Ph. *p.* Ju. ♃ 1—2 ft. Dry woods. A variety of the last.
L. *procumbens*, Mx. *p. y.* Au. ♃ 2—3 ft. Sandy woods.
Liatris *scariosa*, Willd. *p.* Au. ♃ 2—4 ft. Dry rocky woods.
L. *spicata*, Willd. *p.* Au. ♃ 2—4 ft. Bushy fields.
Ligustrum *vulgare*, Linn. Prim. *w.* J. ♄ 10—20 ft. Rocky woods.
Lilium *philadelphicum*, Linn. Lily. *r-y.* J. ♃ 1—2 ft. Meadows.
L. *canadense*, Linn. Nodding Lily. *y. r.* Ju. ♃ 2—4 ft. Meadows.
L. *superbum*, Lk. Superb Lily. *y. r.* Ju. ♃ 3—6 ft. Meadows.
Lindernia *attenuata*, Muhl. *w-b.* Ju. ☉ 4—6 i. Muddy shores.
L. *dilatata*, Muhl. *w-p.* Ju. ☉ 4—6 i. Muddy shores.
Linum *virginianum*, Linn. Wild Flax. *y.* Ju. ☉ 1—2 ft. Bushy fields.
L. *usitatissimum*, Linn. Common Flax. *b.* J. ☉ Fields. Naturalized.
Liquidambar *styraciflua*, Linn. Sweet Gum. M. ♄ 15—40 ft. Low woods.

LIRIODENDRON *tulipifera*, Linn. White Wood. Tulip tree. American Poplar. *r-y*. J. ♄ 40—100 ft. Rich woods.

LITHOSPERMUM *arvense*, Linn. *w*. M. ☉ 8—18 i. Fields.

LOBELIA *cardinalis*, Linn. Cardinal flower. *r*. Ju. ♃ 1—3 ft. Wet grounds.

L. *syphilitica*, Linn. *b*. Ju. ♃ 2—3 ft. Swamps.

L. *inflata*, Linn. Wild Tobacco. *b*. Ju. ♂ 1—2 ft. Fields and road sides.

L. *claytoniana*, Mx. *b*. Ju. ♃ 1—2 ft. Meadows.

LOLIUM *perenne*, Linn. Darnel. M. ♃ 1—2 ft. Meadows.

LONICERA *parviflora*, Lk. *r-y*. J. ♄ Twining. Rocky woods.

LUDWIGIA *alternifolia*, Linn. *y*. Ju. ♃ 2—3 ft. Grassy swamps.

L. *pilosa*, Wr. *y*. Ju. ♃ 18—24 i. Grassy swamps.

LUPINUS *perennis*, Linn. Wild Lupine. *b. p*. M. ♃ 12—18 i. Sandy fields.

LUZULA *pilosa*, Willd. M. ♃ 6 i. Moist woods.

L. *campestris*, Dec. M. ♃ 6—12 i. Woods.

LYCIUM *barbarum*, Linn. Matrimony vine. *r. y*. J. ♄ Climbing. Naturalized.

LYCOPODIUM *clavatum*, Linn. *g*. Ju. ♃ Creeping. Pine woods.

L. *complanatum*, Linn. Ground Pine. *g-y*. Ju. ♃ Creeping. Pine woods.

L. *dendroideum*, Mx. *g*. Ju. ♃ 6—8 i. Woods.

L. *rupestre*, Linn. Ju. ♃ Rocky woods.

L. *lucidulum*, Mx. *y*. Ju. ♃ 8—12 i. Low woods.

LYCOPUS *europeus*, Linn. *w*. Ju. ♃ 1—3 ft. Wet places.

L. *virginicus*, Linn. *w*. J. ♃ 1—2 ft. Swamps.

LYSIMACHIA *stricta*, Ait. *y*. Ju. ♃ 1—2 ft. Low grounds.

L. *thyrsiflora*, Linn. *y*. J. ♃ 12—18 i. Grassy swamps.

L. *quadrifolia*, Linn. *y*. J. ♃ 1—2 ft. Woods.

L. *ciliata*, Linn. *y*. J. ♃ 2—4 ft. Shady banks.

MACLURA *aurantiaca*, N. Osage Orange. ♄ Naturalized.

MAGNOLIA *glauca*, Linn. Swamp Laurel. *w*. J. ♄ 10—20 ft. Swamps.

M. *acuminata*, Linn. Cucumber Tree. *b-y*. J. ♄ 50—70 ft. Allegany Co.

MALAXIS *lilifolia*, Sw. *w-y*. J. ♃ 4—8 i. Damp rich woods.

MALVA *rotundifolia*, Linn. *w-r*. J. ♃ 8—12 i. Road sides.

M. *sylvestris*, Linn. *r-p*. J. ♂ 2—3 ft. Waste fields.

MARRUBIUM *vulgare*, Linn. Horehound. *w*. Ju. ♃ 12—18 i. Road sides.

MARTYNIA *proboscidea*, Glox. Unicorn Plant. *w-y. spotted.* Ju. ⊙ 1—2 ft. Banks of Potomac.

MEDEOLA *virginica*, Linn. *y.* J. ♃ 12—18 i. Rich woods.

MEDICAGO *lupulina*, Linn. *y.* J. ⊙ 1 ft. Procumbent. Open grassy woods.

M. *sativa*, Linn. Lucerne Clover. *p.* Ju. ♃ Cultivated fields. Naturalized.

MELAMPYRUM *americanum*, Mx. *y.* Ju. ⊙ 6—12 i. Woods.

MELISSA *officinalis*, Linn. Balm. *w.* Ju. ♃ Road sides. Naturalized.

MELILOTUS *officinalis*, Lk. *y.* Ju. ⊙ 2—4 ft. Banks of streams. Sweet scented.

M. *leucantha*, Dec. *w.* Ju. ⊙ 3—6 ft. Banks of streams. Sweet scented.

MENISPERNUM *canadense*, Linn. *y-w.* Ju. ♄ Climbing. Banks of streams.

MENTHA *borealis*, Mx. Horse-mint. *p.* Ju. ♃ 9—18 i. Wet places.

M. *tenuis*, Mx. Spearmint. *p.* Au. ♃ 1—2 ft. Wet places.

M. *piperita*, Linn. Peppermint. *p.* Au. ♃ 1—2 ft. Naturalized.

MIKANIA *scandens*, Willd. *w.* Au. ♃ Damp thickets.

MIMULUS *ringens*, Linn. *b.* Ju. ♃ 1—2 ft. Wet grounds.

M. *alatus*, Ait. *b.* Ju. ♃ 1—2 ft. Wet grounds.

MITCHELLA *repens*, Linn. Partridge-berry. *w.* J. ♃ A creeping evergreen. Woods.

MITELLA *diphylla*, Linn. Currant-leaf. *w.* Ap. ♃ 8—12 i. Rocky banks.

MOLLUGO *verticillata*, Linn. *w.* Ju. ⊙ Prostrate. Road sides.

MONARDA *didyma*, Linn. *r.* J. ♃ 18—24 i. Meadows.

M. *oblongata*, Ait. *r-b.* Ju. ♃ 2—3 ft. Dry meadows.

M. *hirsuta*, Ph. *w-b. spotted.* Ju. ♃ 2—3 ft. Rocky banks of Potomac.

M. *punctata*, Linn. *y.* Au. ♃ 2—3 ft. Sandy woods.

MONOTROPA *uniflora*, Linn. Indian pipe. *w.* J. ♃ 4—8 i. Shady woods. Plant white and leafless.

MORUS *rubra*, Linn. Red Mulberry. M. ♄ 15—30 ft. Open woods.

M. *alba*, Linn. White Mulberry. M. ♄ 15—20 ft. Naturalized.

MUHLENBERGIA *diffusa*, Sr. J. ♃ 12—18 i. Rocky woods.

MYOSOTIS *palustris*, With. *b.* M. ♃ 12—18 i. Grassy swamps.

M. *arvensis*, Sibth. *w.* M. ♃ 4—10 i. Sandy woods.

MYRIOPHYLLUM *verticillatum*, Linn. Ju. ♃ 9—18 i. Water.

NASTURTIUM *palustre*, Dec. *y.* Ju. ☉ 12—18 i. Wet ditches.
N. *amphibium*, Br. *y.* J. ♃ 1—2 ft. Wet ditches.
NELUMBIUM *luteum*, Willd. Water Chinquepin. *y-w.* Ju. ♃ Water Eastern shore. *v. s.*
NEMOPANTHES *canadensis*, Dec. *g-y.* Ap. ♄ 3—6 ft. Rocky woods.
NEOTTIA *gracilis*, Bw. *w.* Ju. ♃ 8—12 i. Dry woods.
N. *cernua*, Willd. *g-w.* Ju. 6—18 i. Moist grounds.
NEPETA *cataria*, Linn. Catnip. *r-w.* J. ♃ 2—3 ft. Old fields.
NICANDRA *physaloides*, Gaert. *b.* Ju. ☉ 2—3 ft. Naturalized.
NICOTIANA *tabacum*, Linn. Tobacco. *w. r.* Ju. ☉ Cultivated.
N. *rustica*, Linn. Au. ☉ Cultivated.
N. *paniculata*, Linn. Au. ☉ Cultivated.
NUPHAR *advena*, Ait. Yellow Water Lily. *y.* Ju. ♃ Water.
NYMPHÆA *odorata*, Ait. White Pond Lily. *w.* J. ♃ Water.
NYSSA *aquatica*, Linn. Sour Gum. M. ♄ 30—50 ft. Swamps. Wood difficult to split.
N. *multiflora*, Wang. Swamp Hornbeam. *g.* M. ♄ 30—50 ft. Swamps.
OBOLARIA *virginica*, Linn. Penny-wort. *r.* Ap. ♃ 4—6 i. Sunny banks.
ŒNOTHERA *biennis*, Linn. Scabish. *y.* J. ♂ 3—4 ft. Fields.
Œ. *muricata*, Murr. *y.* Ju. ♂ 1—2 ft. Dry fields.
Œ. *parviflora*, Linn. *y.* Ju. ♂ 1—3 ft. Dry fields.
Œ. *fruticosa*, Linn. *y.* Ju. ♃ 12—18 i. Rocky open woods.
Œ. *hybrida*, Mx. *y.* Ju. 1—2 ft. Old fields and woods.
Œ. *fraseri*, Ph. *y.* Ju. ♃ 1—2 ft. Banks and grassy woods.
Œ. *pumila*, Linn. *y.* Ju. ♃ 8—15 i. Dry field. The Œ *pusilla*, Mx. and Œ. *chrysantha*, Mx. are undoubtedly mere varieties of this species.
ONOCLEA *sensibilis*, Linn. Ju. ♃ 12—18 i. Fern. Moist woods.
ONOSMODIUM *hispidum*, Mx. *w.* J. ♃ 1—2 ft. Dry woods.
O. *molle*, Mx. *y-w.* Ju. ♃ 1—2 ft. Dry woods.
ORCHIS *spectabilis*, Linn. *p.* M. ♃ 3—6 i. Low woods.
ORIGANUM *vulgare*, Linn. Wild Marjoram. *r.* Ju. ♃ 1—2 ft. Woods.
OROBANCHE *uniflora*, Linn. *p-w.* J. ♃ 3—6 i. A leafless parasite. Rich woods.
ORONTIUM *aquaticum*, Linn. Golden Club. *y.* M. ♃ 12—18 i. Shallow water.
ORYZA *sativa*, Linn. Rice. Au. ☉ Cultivated on the Eastern shore.

Osmunda *cinnamomea*, Linn. J. ♃ 2—5 ft. Fern. Wet swamps.
O. *interrupta*, Mx. J. ♃ 1—2 ft. Fern. Bog meadows.
O. *regalis*, Linn. J. ♃ 3—4 ft. Fern. ° Boggy meadows.
Ostrya *virginica*, Willd. Iron-wood. M. ♄ 20—40 ft. Woods.
Oxalis *violacea*, Linn. *p*. J. ♃ 4—6 i. Rich shady woods.
O. *stricta*, Linn. Wood-sorrel. *y*. J. ☉ 6—12 i. Fields.
O. *acetosella*, Linn. Wood-sorrel. *w. r*. J. ♃ 3—4 i. Woods. The Irish Shamrock, according to Dr. L. C. Beck.
Oxycoccus *macrocarpus*, P. Cranberry. *r*. J. ♄ Creeping. Sphagnous swamps.
O. *vulgaris*, Ph. *r*. J. ♄ Creeping. Sphagnous swamps.
Panax *trifolia*, Linn. *w*. M. ♃ 6—8 i. Shady woods.
P. *quinquefolia*, Linn. Ginseng. *w*. M. ♃ 1—2 ft. Shady woods.
Panicum *crus-galli*, Linn. Barn-grass. Au. ☉ 2—4 ft. Cultivated fields.
P. *hispidum*, Muhl. Au. ☉ 3—4 ft. Fields.
P. *clandestinum*, Linn. Ju. ♃ 2 ft. Dry sandy fields.
P. *latifolium*, Linn. Ju. ♃ 1 ft. Woods.
P. *pubescens*, Lk. Ju. ♃ 12—18 i. Sandy fields.
P. *dichotomum*, Linn. Au. ♃ 6—18 i. Open dry woods.
P. *nitidum*, Lk. Ju. ♃ 6—18 i. Dry fields.
P. *agrostoides*, Muhl. Au. ♃ 2—3 ft. Sandy meadows.
P. *virgatum*, Linn. Au. ♃ 3—4 ft. Dry woods.
P. *capillare*, Linn. Au. ☉ 1—2 ft. Dry woods.
Papaver *rheas*, Linn. Wild Poppy. *r*. J. ☉ 12—18 i. Cultivated fields.
Parietaria *pennsylvanica*, Muhl. *g*. J. ☉ 6—15 i. Damp woods.
Parthenium *integrifolium*, Linn. *w*. Ju. ♃ 2—3 ft. Rocky banks of Potomac.
Paspalum *ciliatifolium*, Mx. Au. ♃ 12—18 i. Dry meadows.
Pastinaca *sativa*, Linn. Parsnip. *y*. Au. ♂ 2—4 ft. Naturalized.
Pedicularis *canadensis*, Linn. *y. p*. M. ♃ 6—12 i. Woods.
Penthorum *sedoides*, Linn. *g-y*. Ju. ♃ 12—18 i. Damp places, ditches, &c.
Pentstemon *pubescens*, Ait. *w-p*. J. ♃ 1—2 ft. Dry hill sides.
P. *levigata*, Ait. *w-p*. Ju. ♃ 2—3 ft. Meadows.
Phacelia *parviflora*, Ph. *b*. M. ☉ 6—10 i. Sandy shores.
Phalaris *americana*, Ell. Ribbon-grass. Ju. ♃ 2—3 ft. Cultivated fields.
Phaseolus *perennis*, Wr. *r-p*. Ju. ♃ Twining. Naturalized.
P. *diversifolius*, P. *p*. Ju. ♃ Twining. Sandy fields. Strophostyles.

P. *vexillatus*, Linn. *p.* Ju. ♃ Twining. Sandy meadows. STROPHOSTYLES.

PHLEUM *pratense*, Linn. Timothy grass. Herd's grass. J. ♃ 2—3 ft. Fields.

PHLOX *paniculata*, Linn. *r.* Ju. ♃ 2—4 ft. Meadows.

P. *maculata*, Linn. *r. w.* Ju. ♃ 18—24 i. Meadows.

P. *pilosa*, Linn. *p. w.* J. ♃ 12—18 i. Meadows.

P. *divaricata*, Linn. *p. b.* M. ♃ 1—2 ft. Meadows.

P. *reptans*, Mx. *p. b.* J. ♃ 6—18 i. Stem prostrate. Rocky banks of Potomac.

P. *revoluta*, (mihi) *w-p.* J. ♃ 12—18 i. Damp woods. (3.)

PHRYMA *leptostachya*, Linn. Lopseed. *w-p.* Ju. ♃ 1—2 ft. Shady woods.

PHYSALIS *viscosa*, Linn. Ground Cherry. *y.* Ju. ♃? ☉ 1—3 ft. Road sides.

P. *obscura*, Mx. *y. spotted.* Ju. ☉ 1—2 ft. Roadsides.

P. *pubescens*, Linn. *y.* Ju. ☉ 1—2 ft. Road sides.

P. *philadelphica*, Lk. *y.* Ju. ☉ 1—2 ft. Road sides. Our common Physalis, in its numerous varieties, certainly presents all the characteristics of the four preceding species, and it is questionable with me whether they ought to be retained as distinct species. (4.)

PHYTOLACCA *decandra*, Linn. Poke-weed. *w.* Ju. ♃ 3—6 ft. Road sides.

PINUS *canadensis*, Linn. Hemlock-tree. M. ♄ 40—80 ft. Woods.

P. *nigra*, Ait. Black Spruce. M. ♄ 30—60 ft. Swamps.

P. *resinosa*, Ait. Yellow Pine. M. ♄ 40—80 ft. Sandy woods.

P. *rigida*, Mill. Pitch Pine. M. ♄ 40—60 ft. Sandy woods.

P. *strobus*, Linn. White Pine. M. ♄ 50—100 ft. Sandy woods.

P. *pendula*, Ait. Black Larch. Tamarack. M. ♄ 30—40 ft. Allegany glades.

PIPTATHERUM *nigrum*, Tor. Au. ♃ 2—3 ft. Rocky woods.

PLANTAGO *major*, Linn. Plantain J. ♃ 1—2 ft. Road sides.

P. *lanceolata*, Linn. M. ♃ 6—24 i. Road sides.

P. *virginica*, Linn. J. ☉ 3—9 i. Sandy fields.

PLATANUS *occidentalis*, Linn. Button-wood, Plane-tree Sycamore. M. ♄ 50—100 ft. Banks of streams.

POA *annua*, Linn. Ap. ☉ 6—8 i. Fields.

P. *pratensis*, Linn. J. ♃ 2—3 ft. Meadows.

P. *compressa*, Linn. Blue-grass. J. ♃ 12—18 i. Road sides.

P. *trivialis*, Linn. Ju. ♃ 2—3 ft. Fields.

P. *nervata*, Willd. J. ♃ 3—4 ft. Wet meadows.

P. *canadensis*, P. de B. Ju. ♃ 2—4 ft. Meadows.

P. *pectinacea*, Mx. Ju. ⊙ 8—12 i. Sandy fields.
P. *reptans*, Mx. Ju. ⊙ 6—8 i. Stem rooting. Low banks of streams.
P. *eragrostis*, Linn. Ju. ⊙ 12—18 i. Sandy fields.
Podophyllum *peltatum*, Linn. May Apple. *w.* M. ♃ 1—2 ft. Shady woods.
Pogonia *ophioglossoides*, Ker. *w-p.* Ju. ♃ 8—12 i. Sphagnous swamps.
Polanisia *graveolens*, Raf. *p. y.* Ju. ♃ 8—12 i. Gravelly banks of Potomac.
Polemonium *reptans*, Linn. *b.* M. ♃ 8—12 i. Rich woods.
Polygala *paucifolia*, Willd. *p.* M. ♃ 3—4 i. Woods.
P. *senega*, Linn. Seneka Snake-root. *r-w.* J. ♃ 8—14 i. Woods.
P. *lutea*, Linn. *y.* Ju. ♂ 8—16 i. Sandy woods.
P. *purpurea*, N. *r.* Ju. 12—18 i. Woods.
P. *verticillata*, Linn. *g-w.* J. ⊙ 6—12 i. Fields.
P. *ambigua*, N. *p.* Ju. ⊙ Woods. Very probably synonymous with the preceding.
P. *setacea*, Mx. *w-p.* Ju. ⊙ 1—2 ft. Grassy swamps.
Polygonum *aviculare*, Linn. Knot-grass. *g-w.* M. ♃ 6—12 i. Procumbent. Road sides.
P. *erectum*, Linn. *w.* Ju. ♃ 1—2 ft. Road sides.
P. *tenue*, Mx. *w.* Ju. ⊙ 6—12 i. Rocky woods.
P. *punctatum*, Ell. Water Pepper. *w.* Au. ⊙ 1—2 ft. Low grounds.
P. *mite*, P. *r-w.* J. ⊙ 12—18 i. Low grounds.
P. *virginianum*, Linn. *w.* Ju. ♃ 2—4 ft. Shady woods.
P. *persicaria*, Linn. *r.* Ju. ⊙ 12—18 i. Low grounds.
P. *pennsylvanicum*, Linn. *r.* Ju. ⊙ 2—4 ft. Low grounds.
P. *sagittatum*, Linn. *w.* J. ⊙ Prostrate. Low grounds.
P. *arifolium*, Linn. *r-w.* Au. ⊙ Prostrate. Low grounds.
P. *convolvulus*, Linn. *w. r.* Ju. ⊙ Climbing. Fields.
P. *scandens*, Linn. *w. r.* Ju. ⊙ Climbing. Fence corners.
P. *fagopyrum*, Linn. Buckwheat. *r-w.* Ju. ⊙ 1—2 ft. Naturalized.
P. *orientale*, Linn. *r.* Ju. ⊙ 4—6 ft. Naturalized.
Polymnia *canadensis*, Linn. *y-w.* Ju. ♃ 3—4 ft. Rocky banks of Potomac.
P. *uvedalia*, Linn. *y.* Ju. ♃ 3—5 ft. Shady woods.
Polypodium *vulgare*, Linn. Ju. ♃ 6—12 i. Rocky woods.
P. *hexagonopterum*, Mx. Ju. ♃ 12 i. Woods.
P. *connectile*, Mx. Ju. ♃ 12 i. Rocky woods.
Pontederia *cordata*, Linn. *b.* Ju. ♃ 1—2 ft. Water.

Populus *tremuloides*, Mx. American Aspen. Ap. ♄ 20—30 ft. Woods.

P. *grandidentata*, Mx. Ap. ♄ 40—50 ft.

P. *angulata*, Ait. Cotton-wood. Ap. ♄ 60—80 ft. Banks of streams.

P. *dilatata*, Ait. Lombardy Poplar. Ap. ♄ 50—80 ft. Naturalized.

Porcelia *triloba*, P. Custard Apple. Papaw. *p.* Ap. ♄ 20—40 ft. Woods.

Portulacca *oleracea*, Linn. Purslane. *y.* J. ☉ Prostrate. Road sides.

Potamogeton *natans*, Linn. *g.* Ju. ♃ Water. Upper leaves floating.

P. *perfoliatum*, Linn. *g.* Ju. ♃ Water. Submersed.

P. *lucens*, Linn. *g.* J. ♃ Water. Submersed.

P. *gramineum*, Mx. *g.* Ju. ♃ Water. Submersed.

P. *zosterifolium*, Schum. *g.* Ju. ♃ Submersed.

Potentilla *norvegica*, Linn. Cinquefoil. *y.* J. ☉ 10—18 i. Fields.

P. *canadensis*, Linn. Five-finger. *y.* M. ♃ 2—18 i. Procumbent. Road sides.

P. *comarum*, Dec. *p.* J. ♃ 12—18 i. Swamps. Comarum *palustre*, Linn.

Prenanthes *alba*, Linn. *y-w.* Au. ♃ 2—4 ft. Woods.

P *altissima*, Linn. *p-y.* Au. ♃ 4—6 ft. Woods.

P. *deltoidea*, Ell. *p.* Au. ♃ 2 ft. Rocky woods.

Prinos *verticillatus*, Linn. False Alder. *w.* J. ♄ 4—8 ft. Swamps.

Prunella *vulgaris*, Linn. *p.* J. ♃ 6—12 i. Fields.

Prunus *virginiana*, Linn. Wild Cherry. *w.* M. ♄ 30—60 ft. Woods.

P. *serotina*, Ehr. *w.* J. ♄ 10—20 ft. Woods.

P. *americana*, Marshall. Wild Plum. *w.* M. ♄ 10—20 ft.

Pteris *aquilina*, Linn. Ju. ♃ 1—2 ft. Woods.

P. *atropurpurea*, Linn. Ju. ♃ 6—12 i. Rocks.

Pulmonaria *virginica*, Linn. *b.* M. ♃ 1—2 ft. Low woods.

Pycnanthemum *incanum*, Mx. *r-w.* Ju. ♃ 1—2 ft. Woods.

P. *linifolium*, Ph. *w.* Ju. ♃ 1—2 ft. Open woods.

P. *lanceolatum*, Ph. *w.* J. ♃ 12—18 i. Woods.

Pyrola *rotundifolia*, Linn. *w.* J. ♃ 6—12 i. Woods.

P. *elliptica*, N. *w.* J. ♃ 6—10 i. Woods.

P. *secunda*, Linn. *g-w.* Ju. ♃ 6—8 i. Woods.

P. *asarifolia*, Mx. *g-w.* Ju. ♃ 8—12 i. Dry woods.

P. *chlorantha*, Sw.? *g-w.* Ju. ♃ 10 i. Dry woods.

PYRUS *coronaria*, Linn. Crab Apple. *r-w.* M. ♄ 15—20 ft. Woods.

QUERCUS *nigra*, Linn. Black Jack. M. ♄ 20—30 ft. Woods.

Q. *coccinea*, Wm. Scarlet Oak. M. ♄ 70—80 ft. Woods.

Q. *rubra*, Linn. Red Oak. M. ♄ 70—80 ft. Woods.

Q. *banisteri*, Mx. Scrub Oak. M. ♄ 4—8 ft. Dry hills.

Q. *alba*, Linn. White Oak. M. ♄ 70—80 ft. Rich woods.

Q. *prinos*, Linn. Swamp Chestnut Oak. M. ♄ 60—70 ft. Low woods.

Q. *virens*, Ait. Live Oak. M. ♄ 40—60 ft. Said to grow on the sea-shore.

Q. *phellos*, Linn. Willow Oak. M. ♄ 40—50 ft. Swampy woods.

Q. *tinctoria*, Willd. Quercitron Oak. M. ♄ 60—70 ft. Woods.

Q. *palustris*, Du Roi. Pin Oak. M. ♄ 40—60 ft. Swampy woods.

Q. *chinquapin*, Ph. Dwarf Chestnut Oak. M. ♄ 3—6 ft. Barren hills.

QUERIA *canadensis*, Linn. *w.* Ju. ☉ 6—12 i. Dry woods.

RANUNCULUS *pusillus*, Poir. *y-w.* Ju. ♃ 6—12 i. Wet meadows.

R. *abortivus*, Linn. *y.* Ju. ♃ 12—18 i. Meadows.

R. *sceleratus*, Linn. *y.* J. ♃ 12—18 i. Wet ditches.

R. *fascicularis*, Muhl. *y.* Ap. ♃ 6—10 i. Woods.

R. *repens*, Linn. *y.* M. ♃ 1—2 ft. Wet meadows.

R. *acris*, Linn. Butter-cup. *y.* M. 1—3 ft. Meadows.

R. *recurvatus*, Poir. *y.* J. ♃ 1—2 ft. Shady woods.

R. *fluviatilis*, Willd. *w. y-w.* J. ♃ Water. Stem submersed.

RENSSELAERIA *virginica*, Bk. J. ♃ 10—15 i. Swamps. LECONTIA *virginica*, Cooper.

RHAMNUS *alnifolius*, L'H. *g.* M. ♄ 2—5 ft. Swamps.

RHEXIA *virginica*, Linn. *p.* Ju. ♃ 8—20 i. Wet meadows.

R. *mariana*, Linn. *w-r.* Ju. ♃ 1—2 ft. Meadows. Eastern Shore. *v. s.*

RHODODENDRON *maximum*, Linn. *r. r-w.* Ju. ♄ 5—20 ft. Rocky banks of Potomac.

RHUS *typhina*, Linn. *g-y.* Ju. ♄ 8—15 ft. Rocky banks.

R. *glabra*, Linn. *g-y.* Ju. ♄ 6—12 ft. Fields.

R. *copallina*, Linn. *g-y.* Ju. ♄ 4—10 ft. Bushy fields.

R. *vernix*, Linn. Poison Ash. *g-y.* Ju. ♄ 8—15 ft. Swamps.

R. *toxicodendron*, Linn. Poison Vine *g.* Ju. ♄ Swamps. Rooting on trunks of trees.

RHYNCOSPORA *alba*, Vahl. Ju. ♃ 12—18 i. Grassy swamps.

R. *glomerata*, Vahl. Ju. ♃ 12—18 i. Boggy swamps.

Ribes *floridum*, L'H. Wild Black Currant. *y-w.* M. ♄ 2—3 ft. Woods.

R. *lacustris*, Poir. *g-y.* M. ♄ 3—4 ft. Bushy swamps.

Robinia *pseudo-acacia*, Linn. Locust tree. *w.* M. ♄ 30—40 ft. Rocky woods.

R. *viscosa*, Vent. Clammy Locust. *r. w.* J. ♄ 20—30 ft. Fields.

R. *hispida*, Linn. Rose Locust. Rose Acacia. *r.* M. ♄ 3—6 ft. Cultivated.

Rochellia *virginiana*, Roem. *w-b.* J. ♂ 1—2 ft. Dry woods.

R. *lappula*, Roem. *b.* Ju. ☉ 12—18 i. Road sides.

Rosa *parviflora*, Ehr. Wild Rose. *r.* Ju. ♄ 1—3 ft. Woods.

R. *carolina*, Linn. Swamp Rose. *r.* Ju. ♄ 3—8 ft. Swamps.

R. *rubiginosa*, Linn. Sweet Briar. Eglantine. *r-w.* J. ♄ 3—10 ft. Sandy fields.

Rubus *villosus*, Ait. High Blackberry. *w.* J. ♄ 4—6 ft. Fields.

R. *frondosus*, Bw. *w.* J. ♃ A variety of the last.

R. *strigosus*, Mx. Red Raspberry. *w.* J. ♄ 3—5 ft. Fields.

R. *occidentalis*, Linn. Black Raspberry. *g-w.* J. ♄ 4—6 ft. Fields.

R. *trivialis*, Mx. Dewberry. *w.* J. ♄ Procumbent. Fields.

R. *odoratus*, Linn. Flowering Raspberry. *p.* J. ♄ 3—6 ft. Rocky banks.

R. *saxatilis*, Linn. *w.* J. ♃ or ♄? Creeping. Probably Synonymous with R. *canadensis*.

Rudbeckia *hirta*, Linn. *y. p.* Ju. ♃ 2—3 ft. Bushy meadows.

R. *triloba*, Linn. *y. p.* Ju. ♃ 4—5 ft. Meadows.

R. *laciniata*, Linn. *y.* Ju. ♃ 4—8 ft. Meadows.

Ruellia *strepens*, Linn. *w-p.* Ju. ♃ 12—18 i. Rich woods.

Rumex *crispus*, Linn. Dock. Ju. ♃ 2—3 ft. Fields.

R. *verticillatus*, Linn. J. ♃ 18—24 i. Wet meadows.

R. *acetosellus*, Linn. Sorrel. J. ♃ 6—12 i. Fields.

Sabbatia *angularus*, Ph. American Centaury. *p.* Au. ♂ 1—2 ft. Sandy woods.

Sagittaria *sagittifolia*, Willd. Arrow-head. *w.* Ju. ♃ 12—18 i Wet places. As varieties of this, Dr. Torrey very properly enumerates the following species. S. *latifolia*, Ph. S. *hastata*, Ph. S. *gracilis* Ph. S. *pubescens*, Muhl.

S. *heterophylla*, Ph. *w.* Au. ♃ 8—12 i. Wet.

Salicornia *herbacea*, Linn. Samphire. Au. ☉ 10—15 i. Sandy shores of Patapsco, near its mouth.

Salix *conifera*, Wm. Ap. ♄ 4—8 ft. Shady woods.

S. *nigra*, Marsh. Ap. ♄ 15—20 ft. Banks of streams.

S. *alba*, Linn. Ap. ♄ 30—40 ft. Banks of streams.

S. *rosmarinifolia*, Linn. Ap. ♄ 1—3 ft. Swamps.
S. *muhlenbergiana*, Willd. Ap. ♄ 2—5 ft. Dry woods.
SALSOLA *kali*, Linn. Ju. ☉ 1—2 ft. Shores of Chesapeake.
SALVIA *lyrata*, Linn. Wild Sage. *b.* M. ☉ 1—2 ft. Meadows.
SAMBUCUS *canadensis*, Linn. Black Elder. *w.* J. ♄ 5—10 ft. Meadows.
S. *pubens*, Mx. Red Elder. *w.* M. ♄ 6—8 ft. Meadows.
SAMOLUS *valerandi*, Linn. *w.* Ju. ♃ 8—12 i. Wet places.
SANGUINARIA *canadensis*, Linn. Blood Root. *w.* Ap. ♃ 6—10 i. Woods.
SANICULA *marylandica*, Linn. *g-w.* J. ♃ 1—2 ft. Woods.
SAPONARIA *officinalis*, Linn. Bouncing-Bet. *w.* Ju. ♃ 12—18 i. Road sides.
SARRACENIA *purpurea*, Linn. Side-saddle Flower. *p.* J. ♃ 1—2 ft. Sphagnous swamps.
SAXIFRAGA *virginiensis*, Mx. *w.* Ap. ♃ 1—12 i. Rocky banks.
S. *pennsylvanica*, Linn. *g-y.* M. ♃ 1—3 ft. Wet meadows.
SCHOLLERA *graminifolia*, Vahl. *y.* Ju. ♃ 6—18 i. Floating. Streams.
SCIRPUS *tenuis*, Willd. J. ♃ 8—12 i. Swamps.
S. *capitatus*, Linn. Ju. ♃ 8—18 i. Bog meadows.
S. *acicularis*, Linn. J. ♃ 3—6 i. Swampy meadows.
S. *lacustris*, Linn. J. ♃ 4—6 ft. Grassy swamps.
S. *atrovirens*, Muhl. Ju. ♃ 1—2 ft. Wet meadows.
S. *eriophorum*, Mx. Ju. ♃ 3—4 ft. Wet grounds.
S. *lineatus*, Mx. Au. ♃ 2—3 ft. Wet grounds.
SCLERANTHUS *annuus*, Linn. Knawel. *g.* Ju. ☉ Procumbent. Dry fields.
SCLERIA *triglomerata*, Mx. Whip grass. J. ♃ 1—2 ft. Grassy swamps.
SCROPHULARIA *marylandica*, Linn. Fig-wort. *g-brown.* Ju. ♃ 3—4 ft. Banks of streams.
SCUTELLARIA *lateriflora*, Linn. Scull-cap. *b.* Ju. ♃ 1—2 ft. Meadows.
S. *galericulata*, Linn. *b.* J. ♃ 12—18 i. Meadows.
S. *parvula*, Mx. *b.* J. ♃ 3—6 i. Dry meadows.
S. *levigata*, (mihi.) *b.* M. ♃ 12—18 i. Open woods. (5.)
S. *integrifolia*, Linn. *b.* Ju. ♃ 1—2 ft. Fields and woods.
S. *pilosa*, Mx. *b.* J. ♃ 1—2 ft. Woods.
S. *canescens*, N. *b.* Ju. ♃ 2—3 ft. Rocky banks of Potomac.
SECALE *cereale*, Linn. Rye. J. ⚇ 2—4 ft. Fields. Naturalized.
SEDUM *ternatum*, Mx. False Ice-plant. *w.* J. ♃ Rocks.

S. *telephioides*, Mx. *p.* ♃ 1 ft. Rocky banks of Potomac.
Senecio *hieracifolius*, Linn. Fire-weed. *w.* J. ♃ 3—6 ft. Road sides.
S. *obovatus*, Willd. *y.* M. ♃ 12—18 i. Rocky banks.
S. *balsamitae*, Willd. *y.* J. ♃ 1—2 ft. Rocky banks.
S. *aureus*, Linn. Rag-wort. *y.* J. ♃ 1—2 ft. Wet meadows.
Serpicula *canadensis*, Muhl. Ditch Moss. *w.* Ju. ♃ Water. Submersed.
Setaria *glauca*, P. de B. Ju. ☉ 1—2 ft. Road sides.
Sida *spinosa*, Linn. *y.* Ju. ☉ 1—2 ft. Rocky woods.
S. *abutilon*, Linn. Indian Mallows. *y.* Ju. ☉ 3—5 ft. Old fields.
Silene *virginica*, Linn. *r.* J. ♃ 12—18 i. Rocky banks.
S. *antirrhina*, Linn. *w-p.* J. ♃ 1—2 ft. Dry fields.
Silphium *trifoliatum*, Linn. *y.* Au. ♃ 4—6 ft. Open woods and meadows.
Sinapis *nigra*, Linn. Mustard. *y.* J. ☉ 3—5 ft. Old fields.
Sirymbrium *officinale*, Scop. Hedge Mustard. *y.* J. ☉ 1—2 ft. Road sides.
Sisyrinchium *anceps*, Linn. Blue-eyed Grass. *b.* J. ♃ 6—12 i. Meadows.
S. *mucronatum*, Mx. *b.* J. ♃ 9—12 i. Meadows.
Sium *latifolium*, Linn. Water Parsnip. *w.* Ju. ♃ 2—3 ft. Swamps.
S. *lineare*, Mx. *w.* Ju. ♃ 1—2 ft. Swamps.
Smilax *rotundifolia*, Linn. Green Briar. *g-w.* J. ♄ Climbing. Damp woods.
S. *peduncularis*, Muhl. *g-w.* M. ♃ 2—4 ft. Climbing. Meadows. Flowers fetid.
S. *herbacea*, Linn. *g-w.* J. ♃ 2—3 ft. Climbing. Meadows.
Solanum *dulcamara*, Linn. Bitter-sweet. *b-y.* Ju. ♄ 4—10 ft. Climbing.
S. *nigrum*, Linn. Nightshade. *w. b-w.* J. ☉ 1—2 ft. Fields.
S. *carolinense*, Linn. Horse-nettle. *b.* J. ☉ 1—2 ft. Rocky banks.
Solea *concolor*, Dec. *g.* Ap. ♃ 1—2 ft. Rich open woods.
Solidago *canadensis*, Linn. Golden Rod. *y.* Ju. ♃ 2—5 ft. Fields.
S. *altissima*, Linn. *y.* Au. ♃ 3—6 ft. Fields.
S. *ulmifolia*, Willd. *y.* Au. ♃ 2—3 ft. Woods.
S. *odora*, Ait. *y* Au. ♃ 2—3 ft. Rocky woods.
S. *bicolor*, Linn. *y-w.* Au. ♃ 1—2 ft. Dry woods.
S. *levigata*, Ait. *y.* S. ♃ Wet meadows along Patapsco and Chesapeake.
S. *flexicaulis*, Linn. *y.* Au. ♃ 2—3 ft. Woods.

S. *latifolia*, Linn. *y*. Au. ♃ 2—3 ft. Woods.

Sonchus *oleraceus*, Linn. Sow Thistle. *y*. Ju. ☉ 2—4 ft. Waste grounds.

Sparganium *ramosum*, Sw. Burr Reed. *w*. Ju. ♃ 1—2 ft. Water.

Spartina *juncea*, Muhl. Ju. ♃ 12—18 i. Brackish meadows.

S. *glabra*, Muhl. Ju. ♃ 2—4 ft. Brackish meadows.

Spartium *scoparium*, Linn. Scotch Broom. J. ♄ Naturalized.

Spergula *arvensis*, Linn. *w*. J. ♃ 10—18 i. Fields.

Spermacoce *diodina*, Mx. *w*. Ju. ☉ 6—12 i. Fields.

Spigelia *marylandica*, Linn. Pink Root. *p*. J. ♃ 9—18 i. Rocky woods.

Spiræa *salicifolia*, Linn. *w*. *r-w*. Ju. ♄ 2—4 ft. Meadows.

S. *opulifolia*, Linn. Nine-bark. *w*. M. ♄ 3—6 ft. Rocky banks.

S. *corymbosa*, Raf. *r-w*. Ju. ♄ 10—20 i. Mountain woods.

S. *aruncus*, var. *americana*, Ph. Steeple-weed. *w*. J. ♃ 3—5 ft. Rocky banks.

Stachys *aspera*, Mx. Hedge Nettle. *p*. Ju. ♃ 1—2 ft. Fields.

Staphylea *trifolia*, Linn. Bladder-nut. *y-w*. M. ♄ 6—10 ft. Bushy meadows.

Stellaria *media*, S. Chickweed. *w*. M. ♃ 1 ft. Procumbent. Road sides.

S. *pubera*, Mx. *w*. M. ♃ 6—12 i. Damp woods.

S. *lanceolatum*, Poir. *w*. J. ♃ 6—12 i. Meadows.

S. *longifolia*, Fries. *w*. J. ♃ 12—15 i. Meadows.

Stipa *avenacea*, Wr. J. ♃ 1—2 ft. Open woods.

Stylosanthes *elatior*, Sw. Pencil Flower. *y*. Ju. ♃ 9—12 i. Rocky woods.

Stylypus *vernus*, Raf. *w*. J. ♃ 12—18 i. Meadows.

Symphitum *officinale*, Linn. Comfrey. *y-w*. J. ♃ 1—2 ft. Naturalized.

Tanacetum *vulgare*, Linn. Tansey. *y*. Ju. ♃ 1—2 ft. Naturalized.

Taxus *canadensis*, Willd. Yew. Ap. ♄ 3—6 ft. Rocky hills.

Tephrosia *virginiana*, P. *r*. *y*. Ju. ♃ 12 i. Dry woods.

Teucrium *canadense*, Linn. Wood Sage. *r*. Ju. ♃ 1—2 ft. Damp woods.

Thalictrum *dioicum*, Linn. Meadow Rue. *w*. M. ♃ 1—2 ft. Meadows.

T. *revolutum*, Dec. *w*. Ju. ♃ 2—4 ft. Meadows.

T. *rugosum*, Ait. *w*. J. ♃ 2—4 ft. Meadows.

Thaspium *atropurpureum*, N. *p*. J. ♃ 2—3 ft. Rocky banks.

T. *barbinode*, N. *y.* J. ♃ 2—3 ft. Rocky woods. THAPSIA *trifoliata*, Sp.

THESIUM *umbellatum*, Linn. *g-w.* J. ♃ 9—12 i. Dry woods.

THLASPI *arvense*, Linn. *w.* J. ☉ Fields.

T. *bursa-pastoris*, Linn. *w.* Ap. ☉ 6—12 i. Fields.

THYMUS *serpyllum*, Linn. Wild Thyme. *p.* Ju. ♃ Fields.

TIARELLA *cordifolia*, Linn. *w.* M. ♃ 10—12 i. Rocky banks.

TILIA *glabra*, Vent. Bass-wood. *y-w.* J. ♄ 20—40 ft. Woods.

T. *pubescens*, Ait. *w.* J. ♄ 30—40 ft. Woods.

TRADESCANTIA *virginica*, Linn. Spider-wort. *b.* M. ♃ 1—2 ft. Meadows.

TRICHODIUM *laxiflorum*, Mx. M. ♃ 18 i. Road sides.

TRICHOSTEMA *dichotoma*, Linn. Blue Curls. *b.* Ju. ☉ 6—12 i. Sandy fields.

TRIFOLIUM *repens*, Linn. White Clover. *w.* M. ♃ Fields.

T. *pratense*, Linn. Red Clover. *r.* M. ♃ Fields.

T. *arvense*, Linn. Hare's Foot. *r-w.* Ju. ☉ Dry fields.

T. *agrarium*, Linn. *y.* J. ☉ 8—12 i. Open woods.

T. *procumbens*, Linn. *y.* J. ☉ 3—6 i. Pastures.

TRILLIUM *erectum*, Linn. False Wake Robin. *p. w.* M. ♃ 6—15 i. Damp woods.

T. *grandiflorum*, Sal. *w.* M. ♃ 12—18 i. Rocky meadows.

TRIOSTEUM *perfoliatum*, Linn. Fever Root. *p.* J. ♃ 2—3 ft. Rocky woods.

TRITICUM *aestivum*, Linn. Wheat. J. ☉ 3—4 ft. Fields.

TRIPSACUM *dactyloides*, Linn. Sesame Grass. J. ♃ 3—6 ft. Meadows.

TUSSILAGO *farfara*, Linn. Colt's-foot. *y.* Ap. ♃ 6—10 i. Low grounds.

TYPHA *latifolia*, Linn. Cat-tail. Ju. ♃ 4—6 ft. Marshes.

ULMUS *americana*, Linn. White Elm. Ap. ♄ 40—70 ft. Low grounds.

U. *fulva*, Mx. Slippery Elm. Ap. ♄ 20—40 ft. Woods.

UNIOLA *spicata*, Linn. Au. ♃ 12—18 i. Brackish meadows.

URASPERMUM *claytoni*, N. Sweet Cicely. *w.* J. ♃ 2 ft. Woods.

U. *hirsutum*, Bw. *w.* J. ♃ 2 ft. Woods.

URTICA *pumila*, Linn. *g.* Ju. ☉ 8—12 i. Damp places.

U. *dioica*, Linn. Nettle. *g.* Ju. ♃ 2—3 ft. Road sides.

U. *canadensis*, Linn. Hemp Nettle. *g.* Ju. ♃ 3—6 ft. Damp shady places.

UTRICULARIA *vulgaris*, Linn. Bladder-wort. *y.* J. ♃ 6—8 i. Water. Ponds.

UVULARIA *perfoliata*, Linn. Bell-wort. *y.* M. ♃ 8—12 i. Woods.

U. *grandiflora*, S. *y.* M. ♃ 9—18 i. Woods.

VACCINIUM *stamineum*, Linn. Deer-berry. *w.* M. ♄ 2—3 ft. Dry woods. Berries green.

V. *frondosum*, Linn. *w.* M. ♄ 2—3 ft. Woods. Berries blue.

V. *resinosum*, Ait. Black Whortleberry. *g-r.* M. ♄ 2—4 ft. Woods. Berries black.

V. *corymbosum*, Linn. High Whortleberry. *w.* M. ♄ 6—10 ft. Swamps. Berries Black.

VALERIANELLA *radiata*, Dec. Corn-salad. *w.* J. ☉ 8—18 i. Meadows.

V. *rhombicarpa*, (mihi.) *b-w.* J. ☉ 4—6 i. Meadows. VALERIANELLA *cœrulea*, Eaton's Manual of Botany, 7th Ed. (6.)

VALLISNERIA *spiralis*, v. *americana*, Tor. Ju. ♃ Water. Rivers.

VERATRUM *viride*, Ait. American Hellebore. *g.* J. ♃ 2—4 ft. Swamps.

VERBASCUM *thapsus*, Linn. Mullein. *y.* J. ♂ 3—6 ft. Road sides.

V. *blattaria*, Linn. Moth Mullein. *p. y.* J. ♂ 2—3 ft. Road sides.

VERBENA *spuria*, Linn. *b.* Ju. ♃ 1—2 ft. Decumbent. Road sides.

V. *hastata*, Linn. Vervain. *p.* Ju. ♃ 2—4 ft. Road sides.

V. *urticifolia*, Linn. *w.* Ju. ♃ 2—4 ft. Road sides.

V. *angustifolia*, Mx. *b.* J. ♃ 10—18 i. Sandy fields.

VERBESINA *siegesbeckia*, Mx. *y.* Ju. ♃ 3—6 ft. Rocky banks of Potomac.

VERNONIA *noveboracensis*, Willd. *p.* Au. ♃ 4—6 ft. Fields.

VERONICA *officinalis*, Linn. Speedwell. *b.* M. ♃ 6—12 i. Procumbent. Dry woods.

V. *serpyllifolia*, Linn. *b.* M. ♃ 2—6 i. Road sides.

V. *anagallis*, Linn. Water Speedwell. *b.* J. ♃ 12—18 i. Wet places.

V. *scutellata*, Linn. *b.* J. ♃ 9—12 i. Wet places.

V. *arvensis*, Linn. *w-b.* M. ☉ 3—8 i. Fields.

V. *agrestis*, Linn. *b.* M. ☉ 5—10 i. Fields.

VIBURNUM *prunifolium*, Linn. Black Haw. *w.* J. ♄ 8—15 ft. Woods.

V. *pyrifolium*, Lk. *w.* M. ♄ 5—10 ft. Low grounds.

V. *lentago*, Linn. Sheep-berry. *w.* J. ♄ 8—15 ft. Woods.

V. *dentatum*, Linn. Arrow-wood. *w.* M. ♄ 6—12 ft. Damp thickets.

V. *pubescens*, Ph. *w.* J. ♄ 3—6 ft. Bushy fields.

V. *acerifolium*, Linn. Dockmackie. *w.* J. ♄ 3—6 ft. Dry woods.

VICIA *sativa*, Linn. Vetch. *b-p.* J. ⊙ 1—2 ft. Fields.

V. *cracca*, Linn. *b.* Ju. ♃ 12—18 i. Meadows.

VIOLA *cucullata*, Ait. Blue Violet. *b.* Ap. ♃ 4—8 i. Meadows.

V. *palmata*, Linn. *b.* M. ♃ 4—8 i. Dr. Bigelow very properly considers this a mere variety of the preceding polymorphous species.

V. *pedata*, Linn. Bird-foot Violet. *b.* M. ♃ 3—6 i. Rocky hills.

V. *ovata*, N. *b.* Ap. ♃ 2—4 i. Dry woods.

V. *blanda*, Willd. *w. p.* Ap. ♃ 2—4 i. Wet meadows.

V. *striata*, Ait. *y-w.* J. ♃ 6—10 i. Wet meadows.

V. *canadensis*, Linn. *w-b.* M. ♃ 12—18 i. Damp woods.

V. *muhlenbergiana*, Dec. *b.* M. ♃ 6—8 i. Low grounds.

V. *pubescens*, Ait. Yellow Violet. *y.* Ap. ♃ 6—12 i. Woods.

VISCUM *dichotomum*, Bart. Misletoe. *g-w.* J. ♄ Parasitic, on trees.

VITIS *aestivalis*, Mx. Summer Grape. *g-w.* J. ♄ Vine. Woods.

V. *riparia*, Mx. Odoriferous Grape. *g-w.* M. ♄ Vine. Banks of streams.

V. *labrusca*, Linn. Fox Grape. *g-w.* J. ♄ Vine. Woods.

WINDSORIA *poæformis*, N. Red Top. Ju. ♃ 3—5 ft. Wet meadows.

WISTARIA *speciosa*, N. *b. p.* Ju. ♃ Twining. Cultivated.

WOODSIA *ilvensis*, Br. J. ♃ 4—6 i. Rocky banks. Fern.

W. *perriniana*, Hook. and Grev. Ju. ♃ 8—12 i. Rocks. HYPOPELTIS *obtusa*, Tor.

XANTHIUM *strumarium*, Linn. Clot Burr. Au. ⊙ 2—3 ft. Shores of streams.

X. *spinosum*, Linn. Ju. ⊙ 1—2 ft. Road sides.

XANTHOXYLUM *fraxineum*, Willd. Prickly Ash. *g-w.* M. ♄ 8—12 ft. Low woods.

XYRIS *caroliniana*, Wr. Yellow-eyed grass. *y.* Ju. ♃ 9—18 i. Swamps.

YUCCA *filamentosa*, Linn. *w.* Au. ♃ 2—5 ft. Eastern Shore.

ZAPANIA *nodiflora*, Lk. *w.* Ju. ♃ Creeping. Sandy shores of Potomac.

ZEA *mays*, Linn. Indian Corn. Ju. ⊙ Cultivated.

ZIZANIA *aquatica*, Lamb. Wild Rice. Ju. ⊙ 4—8 ft. Marshes.

ZIZIA *aurea*, Koch. *y.* J. ♃ 1—2 ft. Meadows. SMYRNIUM *aureum*, Linn.

Z. *integerrima*, Dec. *y.* J. ♃ 12—18 i. Woods. SISON *integerrimus*, Sp.

Z. *cordata*, Koch. *y.* J. ♃ 12—18 i. Meadows. SMYRNIUM *cordatum*, Wr.

REMARKS

ON SOME OF THE PLANTS OF THE CATALOGUE.

(1.) The Aster *alatus* described below, is the species generally referred to the A. *prenanthoides,* Willd. I subjoin the characters of Willdenow's plant as given by Sprengel, and cannot help thinking that a slight examination will satisfy any one, that it is a distinct species:

Aster *alatus,* stem angled, flexuous, glabrous below, pubescent above: leaves ovate, slenderly acuminate, tapering to the petiole, sharp serrate, scabrous above, glabrous and paler beneath, serratures sub-mucronate; upper leaves lanceolate sub-entire: petioles winged, clasping: scales of the calyx linear, acutish, reflex-spreading at the apex.

Inflorescence, a loose terminal corymbed panicle, peduncles about 1-flowered, bracted. Calyx sub-ovate, flowers large, rays numerous, narrow, lilac purple; disk yellow, becoming brownish, receptacle flat, naked, sub-alveolate; seeds oblong, minutely pubescent; egret pilose, hairs finely scabrous, root fibrous. Damp shady grounds, Ju. 12–24 i.

Aster *prenanthoides,* Willd. stem branching, branches fastigiate, pilose: leaves clasping, sub-cordate-lanceolate, serrate in the middle: scales of the calyx lanceolate, elongated, lax. A. *longifolia,* Lk?

(2.) The Euphorbia *Eatonii* of the catalogue, is the E. *peplus* of our American botanists, but distinct from the European species, as a comparison of the following descriptions will show. I have suggested the above name for our plant, in remembrance of an old and valued friend, long since dead, T. Dwight Eaton, formerly of the Rensselaer Institute, N. Y. an assiduous and enthusiastic student of nature.

Euphorbia *Eatonii,* umbel 3–cleft, dichotomous: involucels, heart-reniform, sessile: lower cauline leaves obovate, petiolate, sub-crenulate, undulate; upper ones sessile, cordate and reniform, entire: fruit 3 smooth, ovoidal, 1–seeded capsules; arils cinereous pitted.

Stem branching, floral leaves large, calycine involucre often 4–cleft or lobed with lobes, bicuspidate. Sandy meadows, flowers light green, May, ⊙? 12–18 i.

Euphorbia *peplus* Linn. umbels 3–cleft, rays dichotomous: bracts ovate, involucral appendages, bi-cuspidate: leaves obovate, obtuse, very entire, emarginate: capsules angled, keeled.

(3.) Phlox *revoluta,* glabrous, stem erect, sub-simple: leaves sub-sessile, scabrous and revolute on the margin, coriaceous, paler beneath; lower ones lance-linear, acute at each end; upper ones lanceolate, rounded at the base: divisions of the corol obovate, slightly crenulate: divisions of the calyx lanceolate, acute, unawned.

Stem slightly scabrous at the top; corymb sub-fastigiate, few flowered: pedicels sub-scabrous; divisions of the calyx half as long as the corol. Easily distinguished from the other species of this region by its thick, shining leaves. Damp woods, flowers light purple, June, ♃ 12–18 i.

(4.) Sprengel has reduced five of our generally received species of Physalis to two, by giving the P. *philadelphica*, Lk. and P. *obscura*, Mx. as synonyms of Physalis *angulata*, Linn. and the P. *lanceolata*, Mx. and P. *viscosa* Jac. as a synonym of Physalis *pennsylvanica*, Linn. I would feel disposed to go still farther, and consider the P. *angulata* and P. *pennsylvanica*, Linn. as synonyms. The P. *viscosa*, Linn. is given by Sprengel, as a native of South America, from the vicinity of Buenos Ayres. If it is a distinct species, one might venture to assert, that it is not quite as common in the United States, as has been supposed by our botanists; and we may safely say too, that if the P. *angulata*, and P. *pennsylvanica*, Linn. are distinct, we have but one in this country. All our varieties being evidently varieties of one species. I add Sprengel's descriptions of the three, for the satisfaction of the curious.

P. *pennsylvanica*, Linn. leaves ovate-oblong, repand, sub-villose beneath: branches sub-villose: flowers peduncled, sub-solitary: stem herbaceous: root fibrous. North America, (P. *viscosa*, Jacq. P. *lanceolata*, Mx.)

P. *angulata*, Linn. leaves ovate, glabrous, repand, tooth-angled: stem very branching; branches angled. N. Amer. E. and W. Indies. (P. *philadelphica*, Lk. P. *obscura*, Mx.)

P. *viscosa*, Linn. leaves subcordate-ovate, repand-angled, obtuse, sub-villose beneath: flowers sub-solitary, peduncled: fruit viscose: stem herbaceous; branches sub-villose. Buenos Ayres.

(5.) Scutellaria *levigata*, stem simple, smooth: leaves petioled, ovate, acute, or sub-acuminate, tapering to the base, coarse serrate, entire at the base and apex, glabrous, paler beneath: raceme simple, terminal; flowers sub-pubescent, erect.

Stem slender, leaves opposite, minutely ciliate, veined, lower ones more rounded and broader, flowers large bracted, upper bracts smaller, entire. Open woods, flowers blue,—May, ♃ 12–18 i.

It has been suggested by a friend, that this species is the one generally called S. *ovalifolia*. It cannot be the S. *ovalifolia* of Persoon; and I am unable to find any other authority for that name. Dr. Torrey has described a Scutellaria *ovalifolia* in his compendium, but I do not know that he considers that species identical with Persoon's. If distinct, as I believe it to be, it requires a distinct name. The following is Persoon's description of his plant:

Scutellaria *ovalifolia*, leaves sessile, ovate, serrate, upper ones lanceolate, somewhat entire. S. *integrifolia* L? Hab. in Virginia, Canada. Flowers glabrous.

(6.) Valerianella *rhombicarpa*, stem dichotomous above: radical leaves obovate; cauline leaves, spatulate-oblong, ciliate; upper leaves toothed at the base: fruit compressed, rhomboidal. Valerianella *cœrulea*, Eat. Man. 7th Edit.

Stem ciliate angled, cyme sparingly branched, level topped, involucre ciliate, scarious at the apex. Meadows, flowers very small, blueish white; June, ☉ 4–6 i. This plant is found abundantly with the V. *radiata*, but can easily be distinguished by its habit, and by the form of its fruit.

ARTICLE IV.

A description of the Frostburg Coal formation of Allegany county, Maryland, with an account of its geological position. By PHILIP T. TYSON.

[Read before the Academy, Feb. 9, 1837.]

THE centre of this basin is about 115 miles from Baltimore, in a direct line, bearing N. 80° West; its northern limit is near the southern boundary of Pennsylvania, from which it extends south south-westerly, about 25 miles, with a breadth varying between six and seven miles. The Potomac river enters the south-western part of the basin, or rather trough, and flows N. N. E. about six miles, when it receives the Savage river through a gap in Savage mountain, and soon after passes laterally out of the trough through a gap in Dan's mountain. About six miles from the N. N. Eastern limits of the trough, a *col* or spur crosses it, laterally connecting Dan's and Will's mountains. Three streams take their rise in this col, near the village of Frostburg. The largest, called George's creek, flows longitudinally through the trough, and enters the Potomac, about 1½ miles in a direct line, below the mouth of the Savage river. Braddock's run flows easterly, through a gap in Dan's mountain, and enters Will's creek about 1½ miles above the town of Cumberland. Jenning's run flows north-east about six miles from Frostburg, then east through a gap in Dan's mountain, and enters Will's creek about three miles above Cumberland. It will be observed, in the sections, that the coal series is deposited between Dan's and the Savage mountains. The eastern part forms the summit of Dan's mountain, while the Savage is almost entirely composed of the coal rocks. The strata dip on every side towards the central parts of the trough, which consequently somewhat resembles in form an American canoe; the inferior limit of the series, is estimated to be from 550 to 600 feet above tide water; the edges of the upper half of the series only, was exposed on the hill sides, within the limits of the lands to which our professional investigations were confined. These embraced the central portions of the trough, within which, a

PLATE II

FROSTBURG COAL DISTRICT

Fig. 1

Base of Profile _ Level of Tidewater

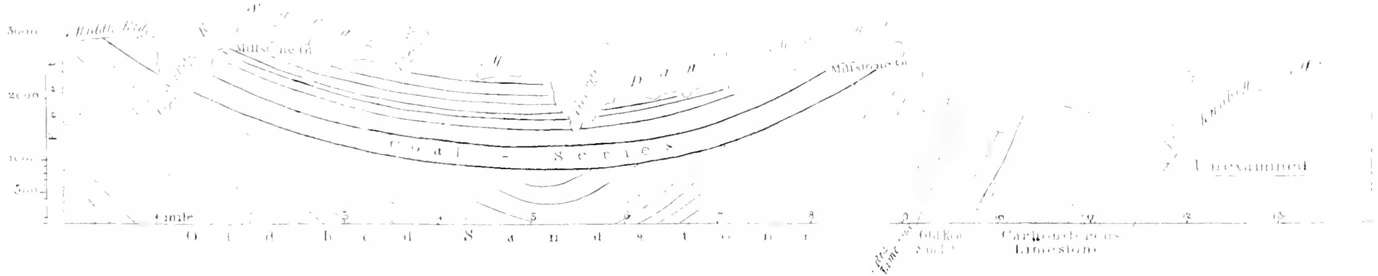


Fig. 2

topographical survey was made, under the direction of my colleague, J. H. Alexander, Esq. over a tract of country embracing more than twenty square miles. The streams before noticed, with their numerous tributaries, have formed ravines to such an extent, as to have removed perhaps two-thirds of the contents of the beds as they once existed; they have however compensated for the waste, in furnishing facilities for the investigation and extraction of the valuable materials, without the expenses attendant upon deep mining and pumping; for the whole quantity of coal and iron ore at present known, amounting to about sixty feet of the former, and more than ten of the latter, may be extracted without the use of a shaft, and consequently without having to lift the water.

George's creek, in its passage from Frostburg, cuts through beds of the series, whose aggregate thickness is about 1300 feet, and nearly reaches the inferior limits. The Potomac has carried off nearly the whole of the principal beds of coal in the part of the trough through which it flows; the main coal or fourteen feet bed being 8 or 900 feet above the river, and is only found in small areas in the few hill tops, or spurs from the mountains on either side, which preserve that elevation. Jenning's run descends 100 feet to the mile, and as the strata rise considerably in the direction of its course, it cuts through the whole series within a few miles of its source. Braddock's run has carried off but a small portion, because it flows laterally, and soon runs out of the basin.

In order to assist in ascertaining the structure of the region and its contents, sections were excavated on divers hill sides, and the position of the beds determined by levellings and measurements. One of these is selected, as the best calculated to illustrate the character of the region. The position is about the centre of the formation on the south-eastern slope of Dug hill, a spur of the Savage mountain. The hill rises abruptly about 550 feet in elevation from the bed of George's creek, and then slopes off gradually 150 feet more. The surface of this last portion, is covered by detached fragments of coarse grit and sandstone, and no excavations were made into the strata thus covered; but in descending, we first find the sandstone (No. 1,) *in situ* about 500 feet above the creek, and 1300 feet above the estimated inferior limits of the series, it is succeeded at 467 feet as follows:

No.	Thickness.	Name.
2.	1.5 ft.	Shale.
3.	2.	Coal.
4.	31.	Slate.
5.	18.	Slate.
6.	4.	Coal.
7.	6.	Sandstone, (fine grained.)
8.	41.	A covering of detritus, containing fragments of limestone, slate and sandstone. It is believed that one of the six feet beds of limestone which have been opened in the vicinity, in the same relative position exists here.
9.	2.	Coal.
10.	101.	Similar to No. 41. Slates and slaty sandstones appeared where the strata which had not suffered disintegration were reached.
11.	8.	Hard sandstone.
12.	42.	Slate.
13.	2.	Shale.
14.	4.5	Coal.
15.	2.	Shale.
16.	1.	Coal.
17.	12.5	Shale, containing vegetable impressions.
18.	14.	Coal, (the principal bed.)
19.	3.	Shale.
20.	3.	Clay containing nodules of iron ore.
21.	23.5	Slate.
22.	31.5	Sandstone, (exclusively siliceous.)
23.	5.	Clay.
24.	5.	Sandstone, (fine grained.)
25.	1.	Nodular iron ore in clay.
26.	17.5	Detritus, except in the lower part, where fine grain sandstone appears *in situ.*
27.	1.	Iron ore stratified sp. gr. 2.946.
28.	7.5	Coal, (called the 8 feet bed.)
29.	5.	Shale.

No.	Thickness.	Name.
30.	1.5	Stratified iron ore, sp. gr. 3.255. This closely resembles some of the ores of South Wales, and has calcareous spar irregularly interspersed through the mass.
31.	2.	Slate clay.
32.	2.	Coal.
33.	1.	Stratified iron ore, sp. gr. 3.541.
34.	2.	Coal.
35.	1.	Shale.
36.	1.8	Stratified iron ore, sp. gr. 3.473.
37.	1.8	Slate.
38.	1.4	Stratified iron ore, sp. gr. 3.374.
39.	1.3	Shale.
40.	3.	Iron ore in layers, alternating with slate sp. gr. 3.374.
41.	3.	Shale.
42.	5.	Iron ore, similar to No. 40, alternating with shale or soft slate,
43.	4.5	Iron ore, similar to No. 40, alternating with hard slate.
44.	1.	Coal.
45.		Indurated ferruginous black slate, thickness unknown.

The last brings us down to the surface of the valley, where the excavations were discontinued, and below this the beds have not been much examined; it is, however, known that a bed of coal 6 feet in thickness crops out near the Potomac, about 600 feet below the 14 feet bed, and that several small beds occur above and below this 6 feet bed.*

The coal of all the beds is analogous in some respects to that of Wales, and may be ranked among the dry coals, the volatile matters being 15 to 20 per cent.; the 14 feet bed appears to be free from sulphuret of iron, of which there are some slight traces in the smaller beds.

The quality of those above the 14 feet bed has not been

* Since the foregoing was written, I have met with a bed of limestone, slightly ferruginous and about six feet in thickness, situated about twenty feet below No. 45. Also one of greater thickness and free from iron, about fifty feet lower than the last.

ascertained; the coal of the 14 and 8 feet beds is of the caking kind, but the coherence of the pieces cemented together is so slight, that it may be readily broken on the grate, a circumstance that, when taken in connection with the fact that the coal of the 14 feet bed, does not make smoke or deposite soot in the chimney, peculiarly adapts it to the warming of apartments; those below the 8 feet coal do not cake. The 14 feet bed is very uniform, wherever it has been opened, but the 8 feet bed does not present exactly the same appearance in any two distant points; for instance, at the Dug hill section it is 7½ feet without seams of shale; 1¼ mile west it is divided by two beds of shale, each 1 foot in thickness—into three beds of coal each 3 feet thick, while three-fourths of a mile to the south-east of the section it is separated by 1 foot of shale into two beds of 4 feet each. In some parts of the district it has been called a 10 feet bed.

The iron ores are such as are common to the coal formations of Great Britain, being carbonate of iron, more or less mixed with argillaceous and calcareous matters, and containing from 25 to 40 per ct. of iron.

Casts and impressions of fossils, have not been found abundantly, and no marine remains have been met with. Among the vegetable remains, are the Glossopteris Phillipsii, calamites, and others not yet determined. The beds in the north-eastern part of the formation, are more highly inclined on the side towards Savage mountain, than on Dan's mountain; while the reverse is the fact in the vicinity of Dug hill, and in the south-western parts of the trough; but the dip no where exceeds 10°, and very rarely 2 or 3°. The shales, slates and limestones, are such as are common to the regular coal formations; but the sandstones, as far as at present known, are less micaceous than usual. The millstone grit, upon which the European coal measures usually rest, has not been observed under this formation; or if it does exist, its thickness must be insignificant; but it seems probable that the formation was originally covered unconformably with the grit, because it appears to be the only rack on the summits of Dan's and Savage mountains, where it lies horizontally. Detached fragments of it are frequently seen on the present surface of the coal basin.

The whole series rests unconformably on the old red sandstone, which appears on the western side of Savage mountain, about 1400 feet from the summit, as represented in the sections in plate 2. It dips at an angle of about 20° under the coal rocks, and re-appears on the eastern flank of Dan's mountain, with a western dip. When first seen in the gap of Jenning's run, its inclination is also about 20°, but the strata curve upwards at a greater distance from the axis of the mountain, and become much more highly inclined. Among the fossils in the red sandstone, which are all marine, only the Producti were determined. Towards the western base of Dan's mountain, the sandstone alternates with red limestone, and finally gives place to the carboniferous, or mountain limestone, against which it rests conformably. Producti have also been met with in this limestone. In colour, it varies from brown to dark blue, and is cavernous: it is inclined at a high angle, and rests conformably upon the siliceous white sandstone of Wills' mountain. The structure of this mountain, is well exhibited at the gap traversed by the waters of Wills' creek; an escarpment on the northern side, reaches an elevation of about 900 feet above the creek, and on the western portion, is covered by a talus for several hundred feet from its base. The central portion of the mountain consists of old red sandstone, which like that under the coal series, is made up of alternations of moderately hard sandstone, and a softer variety passing into shale. When first seen on its western limits, it is highly inclined, and dips westwardly. The strata then bend over in the form of a flattened arch, and dip to the eastward, with an inclination of 12° or 15°, until they pass under the bed of the creek. It is covered by beds of the siliceous sandstone, before referred to, which are several hundred feet in thickness, and form the summit and flanks of Wills' mountain; on the western side, they are almost vertical, and then curving to the eastward, are nearly horizontal at the summit; on the eastern side, we find them bending down until they dip about the same as the red sandstone upon which it rests. At the base of the mountain, the limestone precisely similar to that which was mentioned on the western side, rests conformably upon this siliceous sandstone, and is itself followed by a thick bed of shale, with a conforming stratification.

It is very probable, that the form of Wills' mountain is due to a force acting from beneath, and that the carboniferous limestone, resting upon the flanks of the mountain, formerly constituted a continuous covering, whose upper limits may be represented in the manner which is seen by the dotted line *a a a* on the section. It may be readily conceived, that the portion now wanting, might have been removed in the course of time, when we take into the account the solvent power of carbonic acid, aided by the ruptured condition of the limestone. The greater amount of the elevation must have taken place before the coal series was deposited, because the eastern edges of the carboniferous rocks crop out on the eastern face of Dan's mountain near the summit, and the basin shape proves that there must have been rocks on the eastern side considerably higher than exist at present. Another evidence of the elevation having taken place before the coal era, is in the fact, that the coal series bears the strongest evidence of not having been disturbed by subterraneous movements. There is no appearance of a fault or dike; on the contrary, the same bed at a distance of fifteen miles, and at the intervening points, is found just where it should be if it had never been deranged by partial movements; and we can hardly imagine that the upward motion was every where directly vertical so as to elevate the beds without the least derangement; the amount of elevation must have been at least 2400 feet, that being the elevation of the highest part of the old red sandstone. At the epoch of the completion of the coal formation, no mountains existed in this district where we now find Dan's mountain and the Savage. They are the result of denudation by water, which perhaps required many series of years, and a countless number of floods in the Potomac and Savage rivers and other streams to produce.

ARTICLE V.

On the Composition of Prussian Blue, prepared from different oxides of Iron. By T. Phillips Allen, Corresponding Member of the Maryland Academy of Science and Literature.

[Read before the Academy, January 26, 1836.]

Is prussian blue, prepared by decomposing a salt of *per*-oxide of iron with ferro-prussiate of potash identical with the prussian blue obtained by decomposing a salt of *prot*oxide of iron with ferro-prussiate of potash, and oxidating the precipitate?

This question has not yet been satisfactorily answered. Considering it worthy of investigation, I undertook a series of experiments to endeavour to determine it in my own mind. Many conflicting opinions have been advanced on this interesting subject. The observing manufacturer has always contended that to obtain a blue of first quality, it was necessary to precipitate the solution of ferro-prussiate of potash, with a solution of *proto*-sulphate of iron, and then to oxidize the precipitate by washing it with water, or in preference with acidulated water. The theoretical chemist, on the other hand, has advanced that the blue obtained in this manner was different from that obtained by decomposing a solution of ferro prussiate of potash with a solution of *per*oxide of iron; that the former is inferior to the latter in intensity of colour, and that it is not a neutral prussiate of iron, but is a sub-salt containing an excess of oxide of iron.

Having had occasion to prepare some prussian blue on a large scale, I dissolved 300 lbs. of ferro-prussiate of potash, to which I added a quantity of solution of proto-sulphate of iron, containing 390 lbs. of crystallized salt. On testing the liquor after the precipitate had subsided, I found it contained a large excess of sulphate of iron; whereas, had the decomposition taken place as has generally been supposed, that is, had all the cyanogen in combination with the potassium of the cyanide of potassium and iron, combined with the iron of the 390 lbs. of proto-sulphate of iron, neither the proto-sulphate of iron nor the ferro-prussiate of potash should have been in excess; for I had employed the proto-sulphate of iron and ferro-prussiate of potash in quantities proportional to their equivalents, not wishing to have either in excess. Thinking that there might have been some mistake in the weight of the materials, I weighed carefully 300 grs. of ferro-prussiate of potassa and 390 grs. of crystallized proto-sulphate of iron, dissolved them separately and poured the solutions together, and obtained precisely the same result, a large excess of proto-sulphate of iron. Satisfied as to the accuracy of the experiment, I then dissolved 100 grs. of ferro-prussiate of potassa to ascertain how much crystallized proto-sulphate of iron was requisite to produce a complete mutual decomposition. After several trials, I found that 86 grs. were required, instead of 130 grs. the equivalent of 100 of ferro-prussiate of potassa; so that a portion of potassium is retained in the precipitate, which may be considered as a double cyanide of iron and potassium, containing much less potassium than the common prussiate of potassa. The presence of potassium in this precipitate was discovered by Proust, who did not ascertain its quantitative composition; but from this experiment it is evident that one-third of the ferro-prussiate of potassa is retained in combination with the precipitate, which instead of being $Fe\overline{Cy}^2$ or $\ddot{F}P^2$, is $11Fe\overline{Cy}^2 + 4P\overline{Cy}$, that is, a double cyanide of iron and potassium, in which the cyanogen combined with the potassium, is just one-third of that which was originally combined with it in the ferro-prussiate of potassa. When this precipitate is washed with water, the potassium it contains is dissolved, in the form of ferro-prussiate of potassa, as the iron becomes oxidated, but if the precipitate is washed with acidulated water, the precipitate becomes blue much sooner and no ferro prussiate of potassa is separated; but as the iron becomes oxidated, its capacity of saturation is increased one-third, and the hydro-ferro-cyanic acid combines with it, and the potassa resulting from the potassium, combined with the acid used to acidulate the water. To ascertain whether this was really the case, I dissolved 100 grs. of ferro-prussiate of potassa, precipitated the solution with 86 grs. of proto-sulphate of iron, and after the precipitate had subsided, I drew off the water, then filled up the bottle with water and added 16 grs. of sulphuric acid, a quantity just sufficient to form a neutral sulphate of potassa, if all the potassium combined in the precipitate were to combine with it. The water was acid to the taste and reddened litmus paper, but the materials being left together five months, and shaken every day or two, the precipitate became of a very dark blue, and the water no longer gave any indications of acidity, and was found to contain sulphate of potassa, instead of sulphuric acid. The next thing to be ascertained was to see how much of a salt of peroxide of iron was requisite to decompose 100 grs. of ferro-prussiate of potassa; for which purpose I dissolved 100 grs. of prussiate of potassa, took a given quantity of proto-sulphate of iron, to which I added the necessary quantity of sulphuric acid to constitute the per-sulphate, the iron was oxidated by adding nitric acid, then evaporating to dryness and redissolving in water. After several trials, I found that 100 grs. of prussiate of potassa required to decompose it, a quantity of per-sulphate of iron containing the same quantity of iron as that contained in 86 grs. of crystallized proto-sulphate of iron, that is to say, 86 grs. of proto-sulphate of iron converted into per-sulphate of iron were just sufficient to decompose 100 grs. of prussiate of potassa. From this we are led to conclude that prussian blue, made by decomposing prussiate of potassa with a salt of *prot*oxide of iron, and washing the precipitate with acidulated water until it becomes completely peroxidated is identical chemically with prussian blue obtained in decomposing prussiate of potassa with a salt of *per*oxide of iron; but if the precipitate is washed with water only, it will contain an excess of oxide of iron, and in both cases if dried before it has become completely oxidated, it will contain potassium or potassa as one of its constituents. Having incinerated some prussian blue made with a salt of protoxide of iron, and some made with a salt of peroxide of iron, I found that on washing with hot water the oxide of iron obtained from the incineration of blue made with a salt of protoxide of iron, the water became strongly alkaline; whereas on washing the oxide obtained from the incineration of blue made with a salt of peroxide of iron, the water became very slightly alkaline, from which I infer that prussian blue owes its beauty to the presence of a little potassium or potassa as one of its constituents. Berzelius states that prussian blue made with a salt of protoxide of iron differs from that made with a salt of peroxide of iron, in being readily soluble in water; whereas that made with a salt of peroxide of iron is not soluble in water. I always succeeded in dissolving both; but it is true that the blue made with a salt of peroxide of iron requires much more washing than that made with a salt of protoxide of iron to become soluble.

From the foregoing experiments it appears then, as Mr. Robiquet suggested in a memoir, published in the *Ann. de Chim. et de Physique, tom* 44, that the difference we observe in prussian blue may be attributed to the presence of potassium or potassa, for it is evident that the blue made with a salt of peroxide of iron cannot contain any potassium or potassa, and that made with a salt of protoxide of iron does contain some, unless perfectly oxidated by washing for a long time with acidulated water.

ARTICLE VI.

A descriptive Catalogue of the principal Minerals of the State of Maryland.—By P. T. Tyson.

[Read before the Academy, March 9, 1837.]

For greater convenience and to avoid repetition in noticing localities, the State will be divided into six districts.

The first, embracing more than half of its territory, which lies south-east of a line drawn from Washington through Baltimore, Havre-de Grace, and Elkton, will be called the '*tide-water district.*' Its north-western portion, comprising a narrow belt whose edges are not yet defined, is believed to belong to an upper secondary series, and rests upon the primary rocks of the second of our divisions. It is covered on the south-east by the remainder and larger portion of the first district, consisting of the great tertiary deposites of the United States, which constitute nearly one-half of the territory of the State of Maryland. This region abounds with organic fossils, but its *mineralogy* possesses little interest. It consists of sands, clays, gravel, and loam (in many places abounding with fossils) and in the secondary portion some small beds of ferruginous sandstone, which passes into a coarse conglomerate, composed of siliceous pebbles with a ferruginous cement.

Bog iron ore forms extensive deposites in the northern parts of Somerset and Worcester counties; indeed its formation is still in progress. It is smelted at the Naseongo furnace. *Phosphate of iron* occurs in crystals lining the cavities of the bog ore, and of course impairs the quality of the metal.

Sulphate of lime in crystals is found in many places, but most frequently within the tertiary region. An interesting locality occurs on St. Mary's river, in a bed of clay of a bluish gray colour and very siliceous. The upper portion of the clay abounds with fossil shells, above which there is a considerable covering of ferruginous sand and gravel, containing *lignite* and *iron pyrites.* The spontaneous oxidation of the latter produces sulphate of iron, which in its descent by percolation is decomposed by the carbonate of lime of the shells, and produces the groups of crystals of sulphate of lime, which are mostly to be seen below the shells. Near the mouth of the Patuxent, there is another and similar natural factory, but the form of the crystals differs. Those on the St. Mary's river are all grouped together at one of their ends; frequently eight or ten of them in a group are so arranged as to radiate from a central point, and the flattened prism sometimes six or seven inches long is lessened in thickness outward from the radiating point so as to assume a lanceolate form. The Patuxent specimens are grouped in a similar manner, but the prisms are shorter, more perfect on their sides, and are concave on their outer terminations.

Quartz is found frequently constituting the casts of fossils, both animal and vegetable, and is usually of a coarse impure variety; but in one locality Professor Ducatel met with a specimen of silicified wood, partly composed of fine *blue chalcedony.*

*Amber** exists at Cape Sable on the Magothy river.

Lignite at the same place; and also,

Sulphuret of iron, which in connection with the lignite forms an extensive deposite and furnishes the material for a large manufactory of alum and copperas. The *amber* is

* Dr. Troost.

opaque or faintly translucent, and varies in colour from brown to dull yellow. The *sulphuret of iron* is either crystallized or takes the form of wood, the structure of which may be seen.

In that part of the district nearest the primary rocks *argillaceous carbonate of iron* exists in abundance. It is in the form of nodules, varying from a few inches to several feet in diameter, of a gray colour, and has a compact structure when it does not embrace sand. The cavities of the nodules are often lined with crystals of pure *carbonate of iron*, which in most instances are so small and confused that their form cannot be determined; they approach nearest to that called *mixte* by Haüy. The composition of these nodules in many localities is gradually changed into hydroxide of iron; by acquiring an additional portion of oxygen and combining with water. The carbonic acid being liberated forms bicarbonates of lime, and magnesia or manganese, if these earths be present. The soluble bicarbonate of lime, meeting occasionally with sulphate of iron resulting from the oxidation of pyrites, which is sparingly found in the iron ore deposites, produces the small crystals of sulphate of lime occasionally observed in the cavities of the nodules. The structure of the nodules is changed as well as the composition, but the external form remains unaltered. The oxidation commencing at the surface and proceeding inwards produces a series of concentric layers. The composition of the crystals is also changed, so as to present us with hydrated peroxide of iron, whose crystalline form is that of the carbonate of protoxide.

These ores were extensively smelted before the revolutionary war, and the greater part of the iron exported to England. They now furnish to three furnaces the material for producing a very superior metal. The scarcity of fuel prevents their being more extensively worked.*

THE SECOND DIVISION consists of primary rocks, and extends north-westerly from the first to *Parr's spring ridge*, where the rocks begin to assume the character of transition. This ridge passes through the northeast part of the new county of Carroll, and running south-southwest reaches the Potomac

* Bruce's Mineralogical Journal, vol. i. p. 323.

river between Rockville and the mouth of Seneca creek. The principal rocks of this division are granite, gneiss, and mica slate in all their varieties, besides hornblend rocks, primary limestones, serpentine primary argillite, talcose and chlorite slates, &c.

Quartz is of course abundant, and although it frequently occurs in crystals, fine specimens are rarely obtained. The largest crystals are found in the part of the granite and gneiss region, situated between the Patapsco river and the head waters of the Little Patuxent. Mr. Gilmor* mentions a *fragment* of one weighing nine pounds. These crystals are mostly of the smoky variety and often only semi-transparent. Transparent and limpid crystals have also been found in this and other localities.

Chalcedony, *jasper*, *hornstone*, and *agate* exist in several places, and mostly in connection with the hornblend and serpentine rocks; good specimens of the two former are frequently found, but the finest chalcedony occurs in a primary limestone, 15 miles north from Baltimore; it has a smooth uniform aspect, a beautiful sky-blue colour, and is highly translucent. *Fetid quartz* also occurs in the primary limestone.

The felspar of this district is mostly of the ordinary kind, and in some localities constitutes almost the whole of the granite. On the Baltimore and Ohio rail road, 9 or 10 miles from this city, large veins of a granite of this kind are protruded from below into both the gneiss and hornblend rocks. Occasionally specimens of the felspar have a regular crystalline structure, so that laminæ of several inches in length may be obtained by cleavage; the colour is mostly dull white or yellowish white and salmon, but sometimes greenish. Mr. Gilmor notices crystals of felspar in the gneiss on Jones' falls.

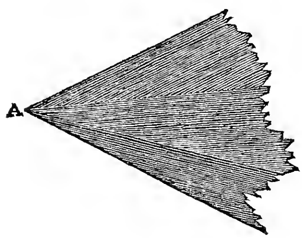
Compact felspar, embracing small imperfect crystals of quartz and specks of *specular oxide of iron*, form a rock that may be ranked with the *weisstein* of the Germans. It occurs just where the Patapsco passes out of our primary division.

An aggregate of quartz and felspar, both white and crystalline, occurs on Jones' falls, 8 miles from Baltimore, containing minute prisms of tourmaline. It lies on the edge of the lime-

* Bruce's Mineralogical Journal, vol. i. p. 323.

stone, and so closely resembles it when seen from a short distance that it has *elsewhere* been described as *limestone containing crystals of hornblend.* It constitutes the *leptinite* of Brogniart.

Mica in nearly all its varieties occurs in many places, and it is much to be desired that the different kinds should be investigated, the more especially since the very interesting optical properties of this subgenus have been discovered. For our present purpose, it is only necessary to notice a few of the most interesting localities. On the Patapsco (the '*prismatique* and *binaire*') crystals of Haüy occur in large grained granite. On Jones' falls, 2½ miles from the city, in a similar granite, prismatic crystals abound, but their sides are much obliterated. One remarkable property of these crystals is that when viewed through the sides of the prism, they are translucent, even if more than one inch broad; yet they are perfectly opaque across the laminæ, when less than the twentieth of an inch in thickness. In the same vicinity, the mica in a coarse granite exists in masses of a cuneiform shape of considerable size and with a peculiar structure, which may be understood by supposing the annexed diagram to represent a section through the mass. The lines represent the laminæ, although they are not so uniform, but are partially interlaced.



Upon separating a portion of the laminæ and holding them up to the light, lines of a dark colour appear, forming part of two or more sides of a regular hexahedral figure, whose centre would be at the apex of the wedge, marked (A). It is probable that the form of the pieces is the result of the operation of a regular law of crystallization, which has not been developed.

In another spot in the same vicinity, mica of similar form embraces *precious* garnets, whose crystallization has been interrupted by the plates of mica, so as to have produced flat crystals; some of which are nearly a quarter of an inch broad, the thickness is variable, some not being thicker than writing paper. They have not been flattened by pressure while soft, because their edges show portions of the faces of symmetric crystals; their form is just what it would be if a perfect crystal were cut by the lapidary on any two opposite sides until it was very thin.

Garnets occur sparingly in the granite and gneiss, but abound in the mica-slates, some of which contain so large a proportion and are of such an extent that the aggregate deserves a specific name. Near the Gunpowder river, 14 to 16 miles north-north-east of Baltimore, this *garnetiferous* mica-slate may be traced for two or three miles.

The forms are (*primitif* and *trapezoidal*) of Haüy, and the prismatic or elongated primitive crystals. Garnets of a large size occur in a disintegrating mica-slate, 3 miles east of the Gunpowder, frequently two inches in diameter; but they are very ferruginous and opaque.

Tourmaline of the common variety occurs in the granite, gneiss, and mica-slate, and occasionally fine specimens are obtained. The *yellow* and *brown* varieties occur in the limestone.

Sphene is sparingly disseminated in some of the Patapsco granite.

Beryl has been found in the granite and in the granite veins of the gneiss, in large crystals.

Phosphate of lime occurs in similar situations.

Sulphuret of iron rarely occurs in the granite, but more frequently in the gneiss, and presents many varieties of crystalline forms.

Pyritous copper exists in small isolated grains in the granite and hornblend rocks on the Patapsco.

Of the minerals hitherto noticed in the granite, all except the *sphene* also occur in the gneiss. And there are many others in the latter rock which have not yet been seen in the Maryland granites. One of the most interesting localities in the gneiss is about 1¾ mile from Baltimore, on Jones' falls, where Dr. Hayden first noticed the following minerals.

Chabazie, (primitif) or Haydenite.

Zeolite, (pyramidal) and radiated.

Sulphate of baryta, (form indeterminate.)

Sulphuret of iron, in crystals of divers forms.

Carbonate of iron, (lenticular.)

These minerals exist in a seam of hornblend, from one to four inches thick; and in the adjoining gneiss, there are cavities whose surfaces are studded with crystals, mostly of chabazie and zeolite, furnishing beautiful cabinet specimens. The crystals of chabazie are transparent when perfect, but are found in every stage of decomposition, which first renders them opaque and finally they fall to powder. The crystals of zeolite are transparent, and of a fine honey yellow colour; the radiated variety is opaque and light yellow.

It is much to be regretted that a disagreement between the two owners of the quarry should prevent either from working at this spot, which has been untouched for several years, and the quarrying is not likely to be resumed. The seam appeared to be increasing in thickness when the operations were suspended.

Sulphurets of zinc and lead were found in a small vein near the locality of chabazie, but as it was not worth working, it has been covered by the refuse from the quarry.

Graphite occurs 16 miles from Baltimore, on the Gunpowder, it is lamellated and very pure.

Sulphuret of molybdenum has been met with near the last, in laminated masses more than one inch broad.

Magnetic oxide of iron occurs in small quantities in several localities.

Titaniferous oxide of iron or *fer-titanè* occurs in abundance in the gneiss of Harford county, and is smelted at two establishments. It is magnetic and possesses polarity.

The common *magnetic oxide of iron* is disseminated in large octahedral crystals in chlorite-slate, near the 'Rocks of Deer creek,' in the same county. It also occurs in an aggregate of chlorite and quartz, near the Forks of the Gunpowder river, 25 miles north from Baltimore, and is associated with

Pyritous copper, (in grains.)

Sphene, in very large crystals: and

Pycnite.

The specular oxide of iron is very rare.

Peroxide of manganese has been worked in Montgomery county. It occurs sparingly in other places.

The mica-slate is variously mixed up with the granite and gneiss, but towards the north-western edge of the granitic range it constitutes the principal rock. It has hitherto furnished but few species of minerals and none possessing much interest.

Mica of course is abundant, and also

Garnets,

Staurotide, and

Cyanite.

The most important localities of garnets have already been mentioned; the staurotide and cyanite are abundant, particularly the former; large crystals of each are common, but mostly imperfect. I have a crystal of staurotide, 1 inch thick and 3½ inches long.

At Scott's mills, 18 miles north from Baltimore, *magnetic oxide of iron* is disseminated in large proportion in the mica-slate, accompanied by cyanite.

The primary limestone of this region occurs in the gneiss and mica-slate, and at one place in hornblend rock; it most usually constitutes the surface of the valleys and in no instance forms a hill of any magnitude. It frequently appears as a large nest or isolated mass embraced by the other rocks. The most important localities are from 8 to 20 miles north to west from Baltimore, where it forms the surface of a number of valleys which are mostly connected together. In some valleys where stratification is visible, it is usually nearly horizontal and the rock is very pure; in other places it is mixed with foreign matters and passes into gneiss or chlorite-slate and is thrown up and much confused.

It varies in structure from very large crystalline grains of pure carbonate of lime to a small grained saccharoidal appearance, which latter kind is used extensively for architectural purposes in Baltimore.

Dolomite abounds in the limestone districts and passes into compact magnesian limestone; in one locality a large grained variety, *apparently* pure, emits a very fetid odour when struck or rubbed.

The following minerals occur in the limestone:—

Quartz, in detached masses and opaque crystals, is often disseminated.

Fetid quartz also occurs in the limestone.

Mica, in small spangles, in those limestones which apparently pass into gneiss.

Talc is most common in the dolomite.

Tourmaline, brown and yellow are occasionally seen.

Tremolite, white, in fibrous and radiated masses is common.

Asbestus, a seam or vein of this substance, extending for many yards, from 1 to 4 inches thick, in dolomite, was exposed recently by the excavations for the Susquehanna rail road. It is perfectly white and its fibres remarkably fine and soft.

Augite, in white and grayish white crystals, rarely perfect, is very abundant in the dolomites. I have part of a crystal, (being as usual a flat prism) which is 4½ inches long and 2½ inches broad.

Red oxide of titanium, in crystals, is occasionally seen.

Fetid felspar, semi-transparent, occurs in a fine grained limestone, at Scott's mills.

Sulphuret of iron, in crystals, is often dispersed through the dolomites, and large pentagonal dodecaedrons are occasionally seen.

Graphite occurs sparingly.

The serpentine and associated tales enter the northern boundary of the State, a few miles west of the Susquehanna river, and are apparently in isolated and independent portions in gneiss and mica-slate. They are generally in a line running south-westerly through the State to the Potomac river, a little west of Rockville. It is *probable* that they are intrusive rocks, but have not been sufficiently investigated to permit more than a mere suggestion that such may have been the case. This formation embraces a variety of interesting minerals, which will be adverted to.

Serpentine, both common and precious, (the latter most abundant near Cooptown) and of a variety of colours; it is opaque or translucent.

Diallage, in lamellated masses, in all the localities.

Talc, in every variety, but rarely in distinct crystals. The finest specimens are the lamellated masses near Cooptown, which present every shade of purple, rose colour, blue, and green.

A beautiful translucent variety of a delicate apple green colour and foliated, occurs in serpentine, on the Gunpowder river, 23 miles north-north-east from Baltimore.

Lithomarge, occurs at 'Soldier's Delight' and Barehills; that of the former locality has all the variety of colour of the Cooptown talc.

Asbestus, of the flexible varieties, most abounds at the Barehills, while the ligniform occurs principally at Cooptown.

Hydrosilicates of magnesia occur at the different localities and furnish a material for the production of a large amount of magnesia and its salts. The proportions of the constituents of this mineral vary considerably. And as its external appearance is somewhat variable, some of the mineralogists of the present day, who cannot be satisfied unless each mineral has at least a score of names, have gratified themselves by favouring the scientific world with a goodly number of new names for this substance. It seems almost to graduate into *opal* on the one hand, and *hydrate of magnesia* on the other. Both in appearance and composition; in fact *semi opal* and the pure *hydrate of magnesia* exist in the serpentine formation.

Hornblend occurs at the Barehills in radiated masses in felspar, accompanied by radiated tremolite of a gray colour.

Tourmaline, in olive coloured crystals of a large size, exists at Cooptown, accompanied by a white opaque substance, in small crystals, whose nature has not been determined.

Pitchstone occurs in a thin seam at Barehills.

Aventurine felspar and beryl are noticed by Dr. Hayden,* on the eastern border of the serpentine at Barehills.

A *dendritic* appearance in the fissures of the magnesian minerals is very common, and beautiful specimens occur at the Barehills; the dendrites are usually oxide of manganese.

Ferroxide of chrome occurs throughout the serpentine. It was first found at the Barehills, in quantities sufficient for manufacturing purposes. But for several years past the serpentine of Harford county, as well as that on the northern border of Cecil county and extending into Pennsylvania, yield the largest amount.

Green oxide of chrome. At the last mentioned locality, a mineral of a beautiful bright green colour, compact, and having a smooth waxy aspect, occurs in very small quantities and has

* Silliman's Journal, vol. 24, pp. 357, 358.

not yet been analyzed. It appears to be either a hydroxide of chrome or a hydrosilicate. The oxides and acids of chrome enter largely into the composition of the colouring matter of the serpentine and its associated magnesian minerals, and with iron and magnesia produce their innumerable varieties of beautiful shades and tints.

Pyritous copper and magnetic oxide of iron occur at one spot, in the Cooptown district, associated with ferroxide of chrome and talc in serpentine.

Sulphuret of antimony has recently been found in the serpentine formation of 'Soldier's Delight.'

It has been already remarked that the mica-slates most abounds in the north-western part of the primary region. It passes by imperceptible gradations into *talcose slates*, and primary argillites, which are remarkable for their great uniformity and for the scarcity of mineral species in that part of this range within the limits of Maryland.

Quartz, having a greasy lustre, is either disseminated in it, or forms veins, which are sometimes of considerable thickness and extent, and it contains no other mineral that has come to my knowledge, except *sulphuret of iron.* In one place the sulphuret of iron has existed in abundance, but the greater part of it has become oxidated, and the rock presents precisely the appearance and is in the same relative geological position as part of the gold region of North Carolina. Of late years this metal has been traced from North Carolina, through Virginia, almost to our borders, and there is some reason to *fear* that it will eventually be found in this state; an evil which it is to be hoped will be averted, because of the tendency that it would inevitably produce of drawing off the attention of the people from more useful and more profitable pursuits.

The third division we proposed to extend from Parr's spring ridge to the foot of the Catoctin mountains, being the basin of the Monococy river. Parr's ridge has usually been considered about the line of separation between the primary and older transition formations, but in fact there is no line of separation. The mica slate absolutely alternates with and passes into the primary argillite, which itself by imperceptible changes passes into both roofing slate and compact blue limestone, decidedly transition. That portion of this division east of the Monocacy river, consists of transition argillite, embracing as subordinate rocks, a variegated silico-magnesian limestone, quartz rock, compact hornblend rock, and old red sandstone in its north-western part. Its minerals are

Sulphuret of copper, (pure.)
Carbonate of copper, (large and fine specimens.)
Pyritous copper.
Sulphuret of lead.
Specular oxide of iron.
Oxide of manganese.
Carbonate of lime in crystals.
Sulphate of baryta.
Quartz in crystals.

Extensive quarries of *roofing slate* are opened in various parts of this district east of the Monocacy, and some of it is well adapted to its appropriate use. There is also an indurated slate, which is easily wrought, resists the action of the weather so as to be used for tombstones and building.

The copper ores, consisting principally of the carbonate and *pure* sulphuret, exhibit very favourable surface indications, in numerous localities between the villages of Newmarket and Taneytown, and are always associated with the variegated limestone, which is not a continuous formation, but consists of isolated masses (without appearance of stratification) embraced by the argillite; in one spot a spherical mass about forty feet in diameter, was completely enveloped by the slate and its existence only known in consequence of an excavation having been made for a road. Although the copper ores are associated with the limestone, yet thus far it appears to be most abundant in the adjacent slates. It does not appear in the mining of these ores, that the *true* vein has been discovered; the ore exists in *pockets*, or is disseminated through the rocks. The whole appearance of the region induces us to think that valuable copper-mines will, at some day, be opened in this part of the country.

Sulphuret of lead exists north of the village of Liberty, but has not been explored.

Specular oxide of iron appears, scattered over the surface, in masses of fifty pounds weight and less, in the vicinity of

Liberty and is very abundant; the cavities are sometimes lined with imperfect crystals.

Sulphate of baryta occurs in lamellated and amorphous masses.

Fine crystals of *calcareous spar* were obtained from one of the mines, and among them I have a specimen containing apparently hemitrope crystals, whose form I have not been able to reconcile with the primitive form of carbonate of lime.

Oxide of manganese is a constituent of a peculiar material of this district; containing black oxide of copper, peroxide of iron, oxide of manganese, and earthy matters. This substance is in a friable condition, and loosely fills up cavities or veins in the slate.

Crystals of quartz, usually white and more or less opaque, were obtained at some of the openings.

It is to be regretted that the mining operations have been suspended; because, under judicious management, it is likely the profit of the owners as well as the cause of science would be promoted by their being continued. The limestone is compact, and presents various shades of green, red, and yellow, but the presence of silica renders it so hard, that the polishing is too expensive to admit of its being brought extensively into use as an ornamental marble. In the northern part of the range a beautiful white marble has been discovered, which is exactly similar to the celebrated Carrara marble.

A seam of *anthracite*, about two inches thick, occurs near the Monocacy river, as I have been informed, but the character of the rock was not stated.

The portion of our district west of the Monocacy, consists of compact blue limestone, clay slate, old red sandstone, and a calcareous breccia with an earthy ferruginous cement. The component masses of the latter vary in size from very minute to twelve inches in thickness, and in many instances they seem to have had their angles and edges rounded off by attrition, before they were cemented together. They have a great variety of colours and shades, such as brown, red, yellow, and white. When polished, they have a very rich appearance, as is exhibited in the columns of the representative hall, in the capitol of the United States.

A few miles north-west of the city of Frederick, there is a micaceous gray sandstone of the coal series, containing vegetable remains converted into coal. Beneath the sandstone these is a bed of shale, four or five feet thick. This is a coal field, geologically speaking; but whether it contains productive beds can only be known by boring. The rocks have been much deranged, and a fault exists at the only spot where the shale has been seen.

A pressure of other engagements renders it necessary to bring these notices to a close. In the next publication it is proposed to give some account of the minerals in the western parts of the State, embracing the fourth, fifth, and sixth divisions. At present they will be briefly alluded to.

THE FOURTH consists of the Catoctin and South mountains and the narrow valley between them. Both of these mountains consist of primary rocks, composed of granular quartz, with epidote and chlorite, and covered by graywack, coarse gritstone, and amygdaloid. Middletown valley laying between them, consists of argillite and chlorite slate. Pyritous and carbonate of copper are extensively disseminated in the rocks of the Catoctin mountain, and native copper has been seen, but I am not aware that there are indications of a true vein, or of a quantity of the ores likely to be of practical importance.

THE FIFTH DIVISION extends from the western base of the South mountain to the western base of Will's mountain, and has been supposed to belong exclusively to the transition series. It consists almost entirely of mountains, with the exception of Hagerstown valley, about twenty miles broad, and a few other valleys of small extent. We are disposed to question whether the portion of this division, lying between Sideling hill and Evatt's mountain, does not belong to the older secondary or carboniferous era. There is, in fact, but little known of the mineralogy or geology of this division. It consists of the blue compact limestone, sandstones (red, gray, and white) with conglomerates, slates, shales, &c.

Red sapphire, in minute grains or crystals, exists at the eastern base of the South mountain. *Sulphuret of lead and iron, specular oxide of iron*, and *sulphate of baryta* occur near Hancock. *Anthracite*, forming a *productive*, field has been opened on the Virginia side of the Potomac, on Sleepy creek.

An impure ferruginous limestone occurs a few miles west of Hancock, capable of producing a hydraulic cement, and at the eastern base of Will's mountain a material is found from which specimens of cement have been made, which appear to be fully equal to the celebrated Parker's Roman cement in the property of resisting the effects of water.

THE SIXTH DIVISION embraces all west of Will's mountain and consists of coal mines and the old red sandstone, on which they rest. The Frostburg coal region is the subject of a separate paper in this volume, and the portion of the State west of it has not been examined. We only know that the '*great western coal field*' embraces the western parts of Maryland. *Sulphate of baryta* in nodules occurs in the Youghagany river, and fine crystals of *quartz* are found on the Meadow mountain; they are either limpid or beautifully clouded.

Peroxide of Manganese rather ferruginous occurs a few miles east of the Youghagany river.

The brown hematitic oxide of iron has not yet been referred to; it was omitted until the regions of country within our six divisions had been noticed. It does not exist in the first division, but occurs in independent beds, or is disseminated in beds of clay or loam, resting on the rocks of all the districts except the first. It occurs in many parts of Baltimore county, and more particularly on the borders of the primary limestones. Extensive beds of it, from 8 to 10 miles north of Baltimore, furnished ore to Hampton furnace for seventy years before they were exhausted, and the enhanced price of wood has prevented the opening of new mines that exist in the same region, of an ore that gives remarkably good metal.

At the eastern base of the Catoctin mountain it exists in abundance; but the quality of the metal is injured by the presence of the earthy *phosphate of iron*, which fills the cavities of the masses of ore. It is however worked at the Catoctin furnace and produces castings of good appearance. At this place it is associated with an ore of zinc, whose oxide forms incrustations in the upper part of the furnace, but we were unable to find any distinct specimens of the zinc ore.

Again, it occurs in the Hagerstown valley in several places, but has less of the *external* appearance of hematite, although it has the same composition.

Both the brown and red hematite occur in the clay and loam which forms the surface of parts of the Frostburg coal region, the latter kind at the gap formed in the Savage mountain by Savage river.

It having been thought desirable that this volume should contain an article upon the mineralogy of Maryland; the writer has attempted to supply it by the foregoing notices, which are intended as a mere outline in order to give a general idea of the mineralogical character of the State, or rather of the eastern portions of it. The consideration of the western portion is the more willingly deferred, because the professional avocations of the writer, during the present year, will probably enable him to become better acquainted with its mineralogy.

ARTICLE VII.

On the detection of Arsenic in Medico Legal Investigations.

By William R. Fisher.

[Read before the Academy, Feb. 11, 1836.]

The form in which arsenic may be most readily administered intentionally as a poison, or accidentally, without any design to destroy life, in this country, is in the condition of white oxide, that being almost the only form in which it is accessible to the community at large. It is the white powder familiarly known as *ratsbane* or *arsenic*, and sold in all the shops, subject to no other restraint in its dispensation, than the conscience of the dealer may impose. There are, however, several preparations or forms, in which arsenic is found, in commerce and the arts;—the white oxide of arsenic already alluded to, metallic arsenic commonly called *cobalt* or *fly-powder;* the red and yellow sulphurets, *realgar* and *orpiment*, and Fowler's solution, the *arsenite of potassa.* The latter of which may be employed as a poison, though more likely to be administered accidentally, as its composition is not generally known. A description here of these several substances is omitted, my purpose being solely to demonstrate the means by which the arsenic they contain may be recognized in complex fluids, or mingled with organic matter. Instances have come within my observation where arsenic has been detected in soup, and in bread. The processes by which the knowledge of its presence has been ascertained and confirmed in those cases have been elsewhere detailed, and I shall presently proceed to demonstrate that the evidence which accumulated during those investigations, was such as forced upon me the conviction of its presence. It is deemed proper here to advert to the principles on which these experiments are based, and I shall occupy but a short space in laying down the few general laws involved in this examination.

The only mode by which any substance may be discovered in a chemical analysis is by combining it with some foreign body called a test or reagent purposely introduced by the experimenter, which by the exercise of affinity, or mutual relation may either combine with the body which we desire to separate, or combining with that, by which the object is already united, may by releasing it from its compound, occasion the separation, and consequent precipitation of the object of our search, either in an isolated or compound form. The experienced chemist is generally sufficiently acquainted with the colour, form, and habits of the precipitates which he has occasion to produce to determine promptly whether that which is yielded by his reagent is characteristic of the substance sought for, or if no particular object be sought, to judge what substance has been developed by his experiment. On this principle of precipitation by reagents are almost all processes for analysis conducted. Another process, however, and one which is essential to the separation of arsenic, is *sublimation*, directly the reverse of precipitation, and which is accomplished by the agency of heat, as in precipitation we avail ourselves of solution in water. It can only be employed when the substance to be separated is not liable to be destroyed or decomposed at an elevated temperature. Where sublimation is employed, it may either be accomplished per se, or by the intermediate aid of reagents. This process as well as that of precipitation will be illustrated hereafter. For the ordinary purposes of investigation the production of one well known and characteristic precipitate or sublimate is generally sufficient to establish the identity of any chemical body. But when human life itself may depend upon the colour, specific gravity, and other properties of a precipitate or sublimate, whose weight is scarcely appreciable by a delicate balance, it becomes an object of vast importance to be enabled to decide without the shadow of a doubt, on the identity of our results with the character of those compounds, which are produced when we apply our reagents to solutions containing certain known elements. Hence every possible care has been taken by toxicologists in describing those phenomena, which are most, nay, infallibly characteristic of the presence of arsenic, and they have not less carefully noted down the false lights by which our steps may be led astray, and our conclusions rendered incorrect by deductions from *false facts*.

Premising then, that the experimenter who is engaged in a medico-legal investigation where poisoning by arsenic is suspected, should come to his task entirely unprejudiced, and with a calm, philosophic determination to note and observe facts as they occur and draw inferences fully warranted by the facts as observed, I proceed to arrange the tests by which his experiments will be performed, and to detail his manner of using them, describing at the same time the results which they produce, and noticing the fallacies to which they may give rise. This caution of preserving an unbiassed mind, may perhaps excite a smile from those whose philosophic pursuits qualify their minds for the investigation of *truth* alone, but the remark is induced from having met with a recorded case, where certain physicians in a country village having conceived that a brother practitioner had treated a patient incorrectly, took up the idea that the man had been poisoned by arsenic, and established, as they thought, the certainty of its presence by a post mortem examination and chemical investigation of the stomach and contents, to the satisfaction of a coroner's jury; while, subsequently, a review of their analysis, by the medical gentlemen accused of malpractice, fairly demonstrated that the patient had died of ordinary inflammation of the bowels, and that a large dose of something which had been given him, and which the inquisitors thought or had heard was arsenic, was an ounce of sulphate of soda, which his physician had prescribed. Counsel in one of our courts, have been known during a trial for poisoning, to apply the Scripture expression of 'seek and ye shall find,' to the chemists who were examined on the trial. Thus much in extenuation of the caution which has been given, to come to the examination totally unbiased. The pieces of apparatus required for such an analysis, are few and simple in their construction: they consist of a spirit lamp, test tubes, a funnel, two or three reducing tubes, a pair of small copper plates, and a small galvanic arrangement invented by Mr. Fischer of Breslaw. With this *appareil* and the necessary tests, which will be hereafter mentioned, the experimenter is provided with all the means necessary to a full examination of the suspected matter. His process is founded on the following facts: That certain reagents which he employs *are known* to produce precipitates of a particular colour and density with the salts of arsenious and arsenic acid: that the salts of these acids, when exposed in a reducing tube, with the black flux, (consisting of carbon and an alkaline salt,) are decomposed, the acid of the arsenic being reduced, and the metal sublimed in the upper portion of the tube, under a particular aspect; that compounds, containing arsenic, mixed with black flux, when heated between two copper plates, are decomposed, the metal being reduced and combining with the upper plate, forming an alloy of silvery whiteness; and finally, that when a solution containing a salt of arsenic is brought into contact with the poles of a galvanic battery, the salt is decomposed, the metal being reduced and found alloyed with the negative pole if it be susceptible of such a combination, or else simply coating it. There is also another property peculiarly characteristic of arsenic, which is the odour exhaled, when arsenic, or any one of its compounds, is thrown upon burning coals. This odour has been compared to that of garlic, or phosphorus, and is generally described in the books, as alliaceous. It is so strongly marked, that when once smelled, it is scarcely possible to forget it.

Having thus explained the principles upon which the operations about to be described are based, I proceed to specify the tests which are usually applied in the analysis of a fluid supposed to contain arsenic. They are ammoniacal sulphate of copper; ammoniacal nitrate of silver; sulphuretted hydrogen gas, or water impregnated with that gas; black flux, a compound formed by deflagrating nitre and cream of tartar;—all these furnish evidence so decided in its character that when they all concur, it is almost impossible that the experimenter can be deceived, in concluding that he has ascertained the presence of arsenic. But when having secured these precipitates, he subjects them to his reducing tube, '*the experimentum crucis*,' he finds again the characteristic appearances produced, his mind cannot fail to be convinced that he has in his hand the fatal agent, which has caused the death, perhaps, or severe illness of some unfortunate victim to carelessness or design.

The matter to be examined may be either food, which has been poisoned, and a portion of which has been eaten, or a portion of that which having been swallowed has been ejected from the stomach, and is much mixed with fluids from the stomach. It belongs not to this place to describe the symptoms or effects which, following the ingestion of a meal, should induce suspicion of poison having been taken. When the task of explaining what pertains to the duties of the chemist who is called upon after well grounded suspicions have been excited, has been undertaken, the examiner should first ascertain that due precautions have been observed in securing the suspected matter, especially if fluid, in a perfectly clean vessel, and that no opportunity has occurred for any admixture of a deleterious agent subsequent to its having been suspected, or before it is given into his charge. Having obtained this essential information a ready mode of deciding promptly whether there be any reason for proceeding to an analysis, will be for the chemist to evaporate a small portion of the fluid, and to throw the resulting extractive upon burning coals. Should the alliaceous odour of arsenic be developed, it induces him at once to proceed to the employment of his liquid re-agents, and his experiments commence. If the subject of examination be a simple colourless fluid it is filtered, and the filter carefully washed with distilled water. The resulting clear solution is then distributed among as many test glasses as it is proposed to apply tests, say three or four. To each he applies re-agents, which are appropriate to indicate the presence of arsenic, and if it be dissolved in the filtered solution, he finds that the ammoniacal nitrate of silver gives a bright yellow

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precipitate, ammoniacal of sulphate of copper an apple green precipitate.

The sulphurreted hydrogen gas, the solution being first slightly acidulated with a drop or two of muriatic or acetic acid, produces a bright yellow precipitate, which subsides upon the liquid being boiled. If these experiments be performed with due care, his mind in an ordinary case would be satisfied with the confirmation of his suspicions, but as his testimony may involve the fate of a fellow-creature, he proceeds to investigate still further the character of his newly formed compounds. Either one or all the precipitates are carefully separated from the fluid in which they are enveloped, by a filter, are dried, and being mixed with black flux, the mixture is introduced into the reducing tube, the powder adhering to its sides is carefully wiped away, and the end containing the mixture is heated in the flame of a spirit lamp to redness, this process as has been already said causes a decomposition of the arsenical salt if it be present; the metal is reduced and sublimed within one half an inch above the flux, forming a brilliant ring of a steel gray lustre; when examined with a lens the inner crust appears a group of minute shining crystals. This crust may be sublimed higher up in the tube, and if the heat be adroitly applied the metal is converted into octahedral crystals of white oxide of arsenic. His opinion may be still further confirmed by re-dissolving the crystals last obtained, and applying the fluid re-agents de novo, when if the characteristic precipitates be again produced, no doubt can possibly exist of the identity of the subject of his examination with ARSENIC.

The process here related is a general sketch of a mode of procedure proper to be pursued in the examination of a *simple colourless fluid*, suspected of containing arsenic in some one of its forms; but should it be required to examine a mass of solid organic matter under the same suspicions, some preparatory means must be employed to render the arsenic sensible to reagents. The organic matter which has a tendency to embarrass the experiments, and invalidate our confidence in the results must be destroyed, and this may be best accomplished by treating it with muriatic acid, boiling and evaporating to dryness repeatedly, until all appearance of organic structure is destroyed, and nothing is apparently left but a black carbonaceous mass. The effect of this operation is to deprive the animal or vegetable matter of its nitrogen, oxygen and hydrogen, and to leave the carbon, which is indestructible by these agents, with the arsenic, if any be present, diffused through it. It is perhaps necessary to suggest as a caution that the evaporation be conducted at a moderate heat, the arsenic may otherwise be volatilized and escape a subsequent examination. This metal if it have been introduced in the metallic form or *fly-powder*, or white oxide, *rats-bane*, is by this action of the nitric acid, if any have been employed, converted into arsenic acid, a higher degree of oxidation than it has been supposed to possess in the first hypothetic case. In cases when the destruction of the organic matter can be accomplished without the use of nitric acid, I consider it decidedly preferable to omit it, for this reason, that its effect must invariably be to bring the arsenic into its highest state of oxidation, arsenic acid, a precipitate from which by sulphuretted hydrogen is obtained with far less facility than from arsenious acid, or one of its salts. When brought into this condition, the next process is to lixiviate the carbonaceous mass, by triturating it well with boiling distilled water, which dissolves out the arsenic, or arsenious acid. The solution being now filtered, there exists for the purposes of experiment, the arsenical compound, in a *simple almost colourless fluid*, and the mode of rendering its presence appaıent, is almost precisely the same as in the former case. To the solution thus obtained lime water should be added. The addition of which occasions a white precipitate of insoluble arsenite of lime. This arsenite of lime is to be dried, mixed with black flux, and the mixture submitted to the process for reduction and sublimation as before explained. It may be proper to mention here that if this process be conducted in a tube, open at both ends, we may have beside the deposite of crystals and the lustrous ring, an alliaceous odour, with fumes proceeding from the upper orifice. Another very satisfactory process, if we have obtained the solution of arsenic acid, in distilled water, is to test a portion of it with the ammoniacal nitrate of silver, when instead of a lemon yellow coloured precipitate, which followed its addition in the former case, we have one of a brick red colour. The remaining portion of the solution may then be treated with sulphuretted hydrogen gas, or water containing that gas in solution, and the bright yellow coloured precipitate is thrown down, as shewn in the former example. This precipitate, dried, mixed with the flux, and submitted to the reducing experiment, yields the ring, the crystals, and other characteristics of the metal, which will be readily recognized by an experienced operator. As preliminary to these more minute experiments, the carbonaceous mass, resulting from the action of the acids may be thrown upon burning coals, when the well known alliaceous odour will be exhaled if arsenic be present in the mass.

The operations necessary under two forms, in which chemists may be called upon to show thé presence of arsenic have now been detailed; there are two general heads yet remaining, requiring attention. These are where arsenic may have been mingled with liquid food, as soup, tea, milk, &c. &c. and finally, where neither the food which had been eaten, nor the matter which had been vomited, is accessible, we are compelled to avail ourselves of the contents of the stomach, or even of the substance of that organ itself. The proceeding in both of these cases is almost precisely analogous to that last described. In both of them we have the poison mixed with organic matter, and so far they resemble it and must be subjected to the de-organizing powers of the strong mineral acids heretofore alluded to. But anterior to the application of the acids there are one or two minor operations, which it were well to describe. In the case of poisoned fluid food, the first process is to evaporate the fluid to the consistence of an extract, after which the digestion in the muriatic acid is proper, followed by the same lixiviation and application of the same re-agents, as in the case of the solid organic mixture. Where the stomach and its contents, or any of the other intestines are involved in the examination, we boil the fluid matters as above to an extract, and having pursued the same course as above described, where the anatomical investigations and symptoms of disease, indicate poison as the cause of death, and the frequent vomiting or violent purging may have removed, all traces of it from the fluids, and when our tests applied remain insensible of its presence.—We then commence to look for small undissolved portions which may have attached themselves to the membranes of the intestines.

I shall not attempt to describe the appearances in the intestines resulting from poisoning by arsenic, as that duty may be more ably discharged by the pathological anatomist, but pass directly on to the chemical proceeding necessary to discover it. The stomach or intestines must be cut up into small pieces, and boiled for some time in distilled water, and the fluid filtered off. The remaining animal matter may then be treated with muriatic acid, and after disorganization is complete, the mass must be lixiviated with the water which had been employed to wash it, (the filtered solution above spoken of,) and then commences the application of the usual re-agents as before indicated. It will be readily seen that in all these cases the general mode of proceeding is analogous. The object being to bring the suspected matter into such a form as will render the results of the tests decided and well marked. The process recommended by Mr. Venables, is justly held in high esteem by some chemists, and although I think that the course already indicated will prove satisfactory and efficient, I introduce that of this gentleman, which varies somewhat from that we have described. After having removed the organic matter, and produced the sulphuret, he deflagrates that with nitrate of potassa, which forms arseniate of potassa, dissolves the product, supersaturates the liquid with acetic acid, precipitates with nitrate of silver, and employs the arseniate of silver thus formed for the reduction experiment. His reason for preferring arseniate of silver for reduction being that it parts with all or nearly all of its arsenic, while the sulphuret only yields about a third. Christison considers this process to be too much complicated to be generally successful, except in the hands of a very expert operator. There are, perhaps, never two cases requiring investigation presented to the chemist under precisely identical forms and circumstances. He must, therefore, be guided altogether by general principles in making his analysis, and the principle of the greatest consequence, and to which he must give the strictest attention is to reduce his subject to such a form as shall render the action of his re-agents prompt, decided, and not liable to afford any deceptive result in colour, form or density. This can most easily be accomplished by adopting the processes which have been before described, whereby the metal, or its compound, is brought to our use dissolved in a simple colourless fluid.

The many and variously designed processes which have been recommended by writers for the detection of arsenic have been purposely omitted. It would serve no useful purpose to recapitulate them, and would merely tend to embarrass the memory, without at all elucidating the subject. The processes which are described are simple, easy of manipulation and have answered in cases which fall within each of the general divisions. So far as can be foreseen, they are adapted to any case which may occur—they are at least as well adapted to practice as any of the numerous processes by which the books are overloaded. Indeed there has always seemed to me, an appearance of empiricism in the processes laid down for the detection of arsenic, as though an analysis of an inorganic, or organic compound, supposed to contain arsenic, were to be pursued upon other principles, than those by which ordinary analysis is conducted.

I do not wish to be understood as preferring any claim to originality in these descriptions of the processes or the employment of any new means for the discovery of arsenic. I merely wish to dispel the idea, which a student may acquire, that the process for discovering arsenic, is a process *per se*, and not one based upon the general principles of chemical science, an idea, which it is thought he may easily acquire, from the manner in which the process is described in the books. A regular routine is described through which every part must pass, without any regard to the particular form and circumstances under which it may be presented for examination, and which may be infinitely varied beyond the conception of the most fertile imagination. From this stricture the excellent treatise of Dr. Christison on the detection of arsenic, in his work on poisons must be exempted, as he has placed the matter in its true light and properly excluded, or but casually mentioned, many of the obsolete and imperfect processes. Having thus expressed my antipathy to a routine practice, I must emphatically disclaim all desire of prescribing the course which should be pursued, in the analysis of substances supposed to contain arsenic. I claim to stand upon a broader basis, and ask for the analysis of such substances the same application of the general principles of chemical science, which are applied to other analysis. The opinion is entertained, that if such were the case, the results of the analyst would be less liable to fallacy, and his opinions less frequently subjected to the criticism of the gentlemen of the bar, or the mortifying fact of finding all his inductions contradicted by a professional rival, deemed perhaps by the auditory, equally expert and profound.

Impressed with the importance of these views, I have designated, in a former portion of this essay, the great principles upon which the processes subsequently described were based, and having performed that duty, the propriety of such a course is humbly submitted to the judgment of all those whose studies and pursuits enable them to decide on its advantages and defects. These general observations are perhaps all that this branch of the subject requires, and I shall now proceed to describe the action of each particular test, the effect which it produces, and the fallacies to which it is liable. They will be described in the order in which they have been used, and first, therefore, the *Ammoniacal sulphate of copper.* The fallacies to which this test is liable, are chiefly referrible to the presence of organic matters in the solution to be examined, but if the means be employed to remove them which have been elsewhere indicated, these fallacies cannot occur. A yellowish tint in the fluid under examination, or the reflection of yellow rays will give any precipitate which may follow its use, a greenish colour, and such a precipitate almost invariably follows the addition of the ammoniacal salts of copper to any fluid, even distilled water. The least yellow reflection gives a pea green colour to the blue oxide thus precipitated. 'The operation of this test is prevented by hydrochloric, nitric, sulphuric, acetic, citric and tartaric acids in excess. These difficulties are however obviated by manifest precautions. The muriate, nitrate, and sulphate of ammonia also interfere with it according to Hünefeld.' 'Almost all vegetable and animal infusions likewise interfere with its accuracy, as it will strike a green colour where arsenic is not present.'—CHRISTISON.

We do not however recommend this test where arsenic acid is present. It is the *arsenite* and not *arseniate of copper* which has the grass green colour.

The ammoniacal nitrate of silver produces in fluids containing arsenious acid, a lively lemon yellow precipitate, changing to dark brown when exposed to the light, this change is common to all the precipitates of silver. The chemical action is analogous to that described above, the resulting salts being arsenite of silver, which is insoluble, and nitrate of ammonia retained in the solution. This test is also liable to some fallacies. Its action is prevented by the presence of nitric, acetic, citric or tartaric acid in excess, particularly the first and the last, says Christison, an excess of ammonia is also inconsistent with its use. But the salt which is most likely to embarrass its results, is the muriate of soda, which is more likely to occur than any other, and the presence of which may be unsuspected in a simple colourless fluid. The best way to overcome this difficulty, should it exist, is that proposed by Dr. Forbes, professor of chemistry at Aberdeen, which is to employ simple nitrate of silver, until all the muriatic acid be precipitated, adding a slight excess, when the addition of a few drops of caustic liquor of ammonia instantly produces the lemon yellow coloured precipitate, so characteristic in its colour as not readily to be mistaken. Another objection to this test is the presence of any soluble phosphate in the liquid under examination—as the precipitate of phosphate of silver bears a striking resemblance in colour to that of the arsenite, but here we have two safeguards against a false conclusion; one of which is that if but a small quantity of the phosphate be present it will be immediately redissolved in the excess of ammonia present in the test, and the other, is the marked difference in the density of the precipitate, thrown down by arsenious and phosphoric acids. The former being heavy and subsiding promptly, while those of the latter are very bulky, absorbing nearly all the fluid, when first precipitated from which they subside slowly. This test cannot be implicitly relied on, when organic fluids are the subjects of examination, unless the quantity of arsenious acid be rather large. We have before stated, that arsenic acid, or its salts produced with this test, a precipitate of a brick red colour, the arsenite of silver—this we believe is liable to no fallacy.

Sulphuretted hydrogen gas, or water impregnated with that gas is a test, to which most implicit confidence may be given, as its characteristics are well defined, it is easily applied, and but few precautions are necessary for its use. Should the fluid to be examined by it contain any free acid, it must first be neutralized by potassa, and then slightly acidulated by a few drops of acetic or muriatic acid. When the fluid is thus prepared, a stream of the gas, is to be passed through it, for ten or fifteen minutes, or the water saturated with gas is to be poured into it. The effect of this test is, if the arsenic be present in sufficient quantity, to produce a bright lemon precipitate, or if the quantity be exceedingly small, to change the colour of the solution to a bright lemon colour. To insure the full separation of the precipitate the solution must be boiled, because the sulphuret of arsenic is soluble in an excess of sulphuretted hydrogen. This test is liable to a few fallacies. The salts of cadmium are precipitated by it of a very similar colour, but these are exceedingly rare, besides which, the sulphuret of cadmium is soluble in muriatic acid, and insoluble in ammonia, in this respect differing from the sulphuret of arsenic. The salts of selenic acid under certain circumstances yield yellow precipitates with sulphuretted hydrogen, but these salts are exceedingly rare. The per salts of tin, which are of almost equally rare occurrence, in any case requiring a medico-legal investigation, yield yellow precipitates with this test, but they are turned brown by ammonia. It has been objected, that antimonial salts, when treated by sulphuretted hydrogen, give yellow coloured precipitates, but their colour, as is well known to chemists, are of an orange red hue, very distinctly recognized, and distinguished from sulphuret of arsenic. The presence of any acid in the solution, except acetic and muriatic, will produce a dirty yellowish white coloured precipitate, with sulphuretted hydrogen, caused by the separation of the sulphur, but this is easily distinguished from sulphuret of arsenic. When the arsenic exists in the state of arsenic acid, or one of its salts, after the sulphuretted hydrogen has been added to the solution, it is necessary to boil it, and allow it to stand by for some time, before the precipitate forms. Dr. Christison says, that he cannot consider the process he recommends in complex fluids as competent to develope the presence of arsenic acid; from a careful examination of his process, I cannot discover any other reason for his doubt, than the belief that sulphuretted hydrogen will not produce a precipitate with that acid, and if this be his reason, in my opinion it is unfounded; for we have the authority of Rose, perhaps the first analyst of the day, for the fact that sulphuretted hydrogen does produce a yellow precipitate with arsenic acid, and its salts, but to do this requires more boiling and a longer time than for arsenious acid or its salts. This test, of all others, is most implicitly relied on, and its action is so delicate as to produce a precipitate, if the arsenical compound be dissolved in a hundred thousand parts of water. It is an essential aid in the reduction process presently to be described, and is certainly liable to none of the objections by which each of the other tests may be rendered null.

The *reduction process* next claims attention. The tests which have just been described, may be considered rather as incidental, than indispensable, except the last, while we are possessed of so certain a proof, as that about to be explained.

The reduction process, has been emphatically called the 'experimentum crucis,' and it yields a result so eminently decided in its character, being the metal itself in a state of chrystallization generally, that it may be implicitly relied upon by the operator, and when exhibited to a jury, must produce conviction in the mind of the most incredulous. The small quantity of arsenic in any form which may be made sensible by this process, is almost incredible to one who is not familiar with the minute operations of chemistry. The characteristics of arsenic are well marked, says Christison, in crusts which weighed only a 286th part of a grain. Berzelius says, that the 190th of a grain of oxide will yield a good crust, and that he has prepared a crust from a quantity so small as to be insensible to any of his balances.

The manner in which this test is to be applied is, to take the precipitate which has been thrown down by the sulphuretted hydrogen, and to mix it with black flux, or with charcoal and carbonate of soda, and to introduce it into a small glass tube, closed at one end. The dust must be carefully wiped away from the sides of the tube, and any moisture which may be condensed on the sides during the process, must also be carefully removed during the operation. The heat of a spirit lamp is gradually applied, commencing a little above the portion occupied by the flux, &c. The heat is then gradually raised, until the glass and its contents become red, while the tube is held steadily in one direction, the open end being inclined upwards. The crust which forms, possesses the following characters—'The surface next the tube is almost exactly like polished steel, being a little darker in colour but equal in brilliancy and polish; and the inner surface is either brilliantly chrystalline to the naked eye, like cast-iron, or has a dull grayish colour, but appears chrystalline before a common magnifier.' This crust may be converted into white oxide by diminishing the heat of the spirit lamp, and chasing it up and down in the tube, until small octahedral crystals are formed of adamantine lustre. This mode was proposed by Dr. Turner. It would swell this notice far beyond its proper length to comment upon the various modifications which have been proposed for this process of reduction, I shall therefore refer to Dr. Christison for the more minute account of it, and proceed to explain the chemical action which takes place in the process for reduction. If metallic arsenic be subjected to the process, no other effect is produced by the carbonaceous alkaline matter mixed with it, than to reduce the small portion of brown sub-oxide, which is apt to exist with it, and the metal is at once sublimed by the heat, forming the crust before spoken of. But if arsenious acid, or arsenic acid, be present, the acid combines with the alkaline base, forming an arsenite or arseniate, which is less volatile than the metal or its acids, and it is thus retained long enough to afford the carbon, an opportunity to unite with the oxygen of the acid, passing off in the form of carbonic acid, while the metal is sublimed as already described. The arsenic is not all sublimed by any of these processes as has been proved by the experiments of many accurate analysts. When the sulphuret of arsenic is exposed in the reducing tube, the sulphur is separated from the arsenic, and combines with the alkali of the flux, the carbon present preventing the arsenic just liberated from being converted into arsenious acid, by rapidly seizing its oxygen as fast as acquired, and allowing the metal to be sublimed in its uncombined form. A portion of undecomposed sulphuret may be sublimed along with the metal, if the heat be applied too rapidly, or the flux be scanty in proportion to the quantity of sulphuret. Several objections have been made to this process, but I think none which are irrefutable. It has been said that a ring of charcoal finely divided may be taken for the arsenical crust, that antimony forms a crust similar to it, that the action of the flux on the glass in reducing its lead may be mistaken for it, and finally that zinc may be sublimed in its metallic state. But the three former can never deceive one who examines with any care the crust which is produced, and the full white heat required for the sublimation of zinc cannot be obtained in a spirit lamp. The reduction of the lead in the glass, occurs at the bottom of the tube, and cannot extend beyond the actual contact of the charcoal, while the arsenical crust, which only resembles it in its lustre, is generally formed about half an inch above it. The value of this process is now generally appreciated, and in the opinion of most chemists, is alone sufficient to determine the presence of arsenic, how small soever the quantity reserved for examination may be. It is, however, of infinite importance that the preliminary operations be conducted with great accuracy and nicety, where the quantity of material which is brought to the chemist for examination is either very minute in quantity, or much involved by admixture with organic matters. The presence of any empyreumatic matter in the reduction tube is a great source of embarrassment, and is positively interdicted. The tests essential to the detection of arsenic having now been described in general terms, it remains to mention the two or three others which have been enumerated, which will be done in a cursory manner; these tests having become almost obsolete, except the small galvanic circle, which by the way is rather an elegant experiment for the illustration of a lecture than a test, properly so called, for the detection of so violent a poison.

The alliaceous odour, is to be sure strongly marked, but it is liable to so many exceptions, as to be scarcely worthy the name of a *test*. It may serve the analytic mineralogist, whose analyses are never embarrassed with organic matter, but cannot certainly be relied upon in cases where zinc, phosphorus, burning papers, and animal matter exhale an odour, so similar to that of arsenic.

The reduction between copper plates is now seldom used. It is accomplished by laying the suspected matter on one of the plates mixed with black flux, and surrounding it with a circle of the flux; the plates are then placed in contact, and being bound together by iron wire are exposed to the heat of a common fire for a few minutes, when cooled and opened, the upper plate is found coated with a brilliant silvery alloy. The objections to this process are, that charcoal gives an appearance somewhat similar; oxide of tin is said to produce the same appearance, but the most material objection, says Christison, is that it requires a quantity sufficient to try much better tests ten times over.

The galvanic circle of Mr. Fischer, of Breslau, is, as has been said, an elegant mode, where the quantity of arsenic is at our control, but is not sufficiently delicate. It requires too long a time for its operation where the quantity of arsenic in solution is very small, which affords an opportunity for the fluid in the tube to pass out by exosmose. When successfully applied, the effect is to reduce the metal upon the negative wire within the tube, or else to throw it down in the form of powder. The inventor says he could detect by this instrument the tenth of a grain of arsenic, but not when it was dissolved in more than five hundred times its weight of water.

From all that has been said, it will now, I trust, be evident that the means are certainly within our power of detecting arsenic under any circumstances, and however minute in quantity. The objections or fallacies to which the tests are liable, are confined respectively to each test, and are not common to them all, so that when all correspond in their results, it is impossible to doubt their indications. The fallacies too, to which they are liable, are owing in each to a different cause, and hence, they can never all deceive, for it is scarcely possible to conceive a case which shall combine every cause of embarrassment. The chief difficulty, and perhaps, one of the most frequent occurrence is that poison is only suspected after a period when it is almost impossible to collect any of the poisoned food, or whatever other medicine may have been used for its administration. In such cases recourse must be had to the disinterment of the sufferer, and search may be made in the intestines for the poison. The investigations of Orfila and others, induce us to believe that during the decomposition of the animal structure, combinations may occur, which will render the operation of ordinary tests, not only uncertain, but null and void; and if a soluble salt be generated, as may be, the humidity of the soil in which the body is interred, may by percolating through the decomposing mass, entirely wash it way. It is scarcely possible to assign limits to the almost infinitely small portion of arsenic, which may be detected by analysis, so accurate and inevitable are the results of chemical science, when skilfully obtained; but great nicety and scrupulous adherence to every rule which it inculcates, are indispensable to the attainment of such results. In this country, unfortunately, we are compelled to depend in great measure upon unpractised hands, except in large cities, and hence, where evidence is submitted to a jury, unless the chemical witness be known to be expert and practised in his profession, his testimony should be received with extreme caution. It has been shown, by what has already been said, that numerous counteracting causes exist, which may deceive the analyst, and in a case to which reference was made in a very early part of this paper, so great was the deception, that all who were convinced by their experiments of the presence of arsenic, were subsequently shewn, by a critical investigation, to have been completely deceived in their results. With this knowledge of the difficulties and responsibilities which environ the chemical witness, in cases where poison has been suspected to have been administered I have endeavoured to shew what his true course is, and how he may avoid those circumstances which lead to false inductions. If I have failed to do this, an apology is due for having so long occupied your time and patience, but if, on the contrary, these remarks have had any tendency to instruct, I shall consider the time occupied in their preparation, exceedingly well spent. They have been compiled, in the few leisure hours which could be snatched from the active pursuits of business, and are doubtless, far less complete than the importance of the subject demands. They may perhaps, however, awaken a spirit of investigation among some who have hitherto not particularly investigated the subject, and as all of us may be called upon, either as witnesses or jurors, in cases where justice demands a rigid scrutiny into the dark designs of some foul murderous spirit, they may serve to prepare our minds for the proper exposure of its weapons, or to the certain expression of a righteous judgment.

ARTICLE VIII.

The Latitude of Annapolis.—By Hector Humphreys, D. D. President of St. John's College.

[Read before the Academy, April 27, 1837.]

The methods adopted for the determination of the latitude at St. John's college, have been, 1st, by meridian altitudes of the sun, and of known stars, south of the zenith; 2d, by altitudes of Polaris, at the upper and lower culminations, and at the greatest eastern or western elongation; 3d, by altitudes of any well known stars, taken at distances from the meridian, ascertained by the most exact rate of a well regulated time-keeper; and 4th, by Professor Bessel's rule, for the transit of a star across the Prime Vertical, east and west of the meridian. The barometer is placed in the spacious hall of the college, in which the air is not affected by artificial heat, at an elevation of fifty-six feet above the mid-tide, in the Chesapeake bay. The external thermometer, is placed in the shade, out of the building; and both instruments, are well secured against disturbance by accidents. The *time*, has been found, occasionally, by observing the sun, with an excellent sextant and mercury horizon; but, generally, from altitudes of two stars, near the Prime Vertical, at the east and west, taken on the same evening. The most frequent method, has been, to observe only a single star, while in the best position, with a theodolite, taking two altitudes, with the face of the instrument, in its natural position, and two others, in the reversed position of the telescope and of the vernier plate. The time has, also, been obtained by meridian transits, using the theodolite for the purpose. The instruments, were a fifteen inch repeating theodolite, by Troughton, reading to five seconds, and a six inch one, by the same artist, reading to twenty seconds. The first mentioned, is mounted like a transit instrument, and was placed in the plane of the meridian, by passages of Polaris and of Beta, in Cassiopeia, and then verified by transits of other circumpolar stars. To avoid exposure to the open air, an unoccupied room was taken, affording a view of objects at the north and south; and meridian marks were made at considerable distances in each direction. The *variation* was found to be 3° 8′ 10″ west, while the instrument, was in the building, and 2° 41′, when set up at a distance on the college green. The number of observations, has not been sufficient, as yet, to determine the mean amount, accurately. The needle has, of late, exhibited uncommon changes in the variation. The first of these occurred at the time of the aurora, on the 25th of January; when its oscillations extended through more than a degree, the increase of the variation being to the west. On the evening of the 21st of April, at eight o'clock, another aurora occurred, in every way resembling the former, except that the waves did not extend so far to the south. It was even more remarkable, however, for one broad column of white light, extending to the zenith, in the direction of the magnetic meridian, traversing the whole arch of crimson light, and retaining its position for fifteen or twenty minutes. It was succeeded by the ordinary pencils, of the same colour, but of momentary duration. The whole sky, to the north, was covered with the same gorgeous veil that was seen here on the 25th of January, extending nearly up to the zenith; and if the ground had been white with snow, the effect would have been the same. This aurora occurred at about the same age of the moon as the former, a little after opposition, and was not sensibly affected by its presence. The same activity was observed as before in the needle, the variation being increased, for the time, a full degree to the west. Another remarkable aurora took place here, between seven and eight o'clock, on the 3d of April, when the sky was clouded and the wind blowing hard. The light was seen, notwithstanding, in three separate columns, towards the north and east, reaching, at times to altitudes of thirty degrees, exhibiting occasionally, an orange colour, and fluctuating. On this occasion, the motions of the needle, were watched for a considerable time, and were observed to extend over nearly a degree in short periods, when the instrument was as much as possible secured from the agitation of the building. The tendency, was, as before, to the west. A rise of the mercury in the barometer, of four hundredths of an inch, was, also, observed to take place on that evening, in the course of half an hour. A similar rise, had been observed on the 25th of January.

On that occasion, also the needle had shown a stronger tendency than usual to *dip*, being drawn down to the plate, as is observed, when one, improperly, excites electrical action, in a compass, by rubbing the glass. No display of auroral light, of equal splendour, is remembered to have occurred here by any person at this place. It reached as far south as Sirius, and spanned the whole heavens, Orion and Taurus, lying within its border. It exhibited, to that extent, the white light of the common aurora, after the crimson waves had receded. A more interesting fact was observed in connection with this display, in the sudden appearance of the *zodiacal light*, on the evening of January 26th, in great distinctness at the west, extending upwards, nearly ninety degrees from the horizon, and having density enough, towards its base, to conceal the stars in that quarter. This light was observed for many evenings afterwards, and diminished in its altitude, till it ceased to attract attention. A bank of light, of the same kind, was also seen in the west, after the aurora of the 3d of April. In that case, however, it extended along the horizon, instead of forming an inclined column. Another appearance of the same light, was noticed on the 22d of this month, and, now, on the 24th, is observed with great distinctness, as late as nine o'clock, P. M. The light in question does not differ from the common diffused northern light. The appearances, perhaps, are owing, to a highly attenuated electric vapour, or elastic fluid, floating in space in large and small masses, visible only when great depths of its substance are presented to the observer's eye; or when its presence in the rarer strata of our atmosphere, is manifested by the passage of some form of electrical, or if it be preferred, magnetic light.

The latitude of St. John's College, as deduced from many observations, 38° 58′ 35″.617 N. is laid down in the best books at 39.° A series of observations has been commenced for an accurate determination of the longitude; the result of which shall be communicated hereafter.

Annapolis, April 24, 1837.

ARTICLE IX.

Report of the Meteorological Committee.

THE Committee of the Maryland Academy of Science and Literature, to whom was confided the charge of co-operating in the Meteorological Observations, proposed to be continued on four fixed periods of the year, beg leave to present the following report and tables:

It being an object of great interest, before making, as well as before describing such observations, to be provided with a set of accurate and well constructed Meteorological Instruments, the Committee applied themselves first of all, to the arrangement of a barometer, more suitable to the occasion, than those constructed for ordinary purposes. As the best account of the instrument now in the possession of the Academy, and of the novel and excellent arrangement which characterizes it, they would give here the description furnished at their request by the successful artist himself:—

'GENTLEMEN:—Having been directed to construct a standard barometer for the use of the Meteorological Committee of the Maryland Academy of Science and Literature, I submitted to you a plan for such an instrument. Upon your approval of the modifications I proposed to introduce, and of the general method offered for its manufacture, I executed for you an instrument, of which, at your request, I furnish the following description.

The glass tube is 32.5 inches in length; 0.25 internal, and 0.60 external diameter; the upper end being hermetically closed, the lower extremity was ground to a slightly conical form for a length of 1.25 in. for the purpose of being fitted airtight within a pierced circular plate of glass through which the tube passes about one inch; the tube and plate are so ground to each other, that, when the former is placed vertically, the latter shall be perfectly horizontal. This plate, which has a diameter of 3 inches, and a thickness of 0.20, forms the upper part or cover of the cistern, and is introduced for the purpose of furnishing a horizontal surface, against which, the mercury of the cistern may extend and contract in its changes of volume, arising from the varying length of the barometric column, without suffering any change in the height of its surface.

The cistern is made of well seasoned mahogany. The excavation for containing the mercury, consists of a circular pool of 1.100 inch diameter and of the same depth, for receiving the end of the barometer tube; the upper part of this pool is, however, extended to nearly the diameter of the glass plate before mentioned (3 inches) which covers it, leaving only a narrow rim for supporting the plate and attached tube: this part has a depth of 0.167 inch. The cistern thus proportioned, being filled until the mercury shall extend from the tube against the glass plate to a diameter of 2 inches, will admit of fluctuations beyond the barometric range, without the mercury either extending beyond, or leaving the under surface of the plate. This under surface, then, becomes a fixed point from which the measurements for the scale may be accurately laid off. At the coincidence of the lower surface with the tube, a mark was made on the latter; the plate being removed, 30 inches were measured off and another mark made on the tube; to this mark the scale was laid down.

The arrangement for the scale consists of a brass tube, 7 inches long, and of a diameter to fit over the barometer tube, to which it is firmly cemented. This tube extends two inches above the top of the barometer; and from the top of the barometer tube, for a length of three inches downwards, is opened on opposite sides one-quarter of its circumference, so as to expose the barometer tube and admit of vision through that part of it which is unoccupied by the mercury. Over this brass tube, a sliding one is fitted of nearly the same length, the lower end of which is brought in coincidence with the top of the mercurial column, when observation is made of its altitude. Attached to the upper end of the tube, is a micrometer screw, which works in the top of the fixed tube; affording an easy means of bringing the termination of the sliding tube in the same horizontal line with the surface of the mercury.

On the fixed brass tube a scale is graduated to fiftieths of an inch. The micrometer screw has fifty turns to the inch, and the micrometer head being divided into twenty parts, a subdivision of the scale is effected to thousandths.

The glass plate covering the cistern is pierced between the centre occupied by the barometer tube and its rim, with a hole just sufficient to allow the stem of a small thermometer to pass through it, the bulb of which is immersed in the mercury of the cistern, for indicating its temperature. The cistern has a number of small holes made through it, on a line with the under surface of the plate for establishing a free communication with the external air; which otherwise would be prevented by the mahogany rim that confines the plate in its seat.

The end of the barometer immersed in the mercury, is furnished with a thin platinum cylinder of 0.375 inch breadth, constituting Professor Daniell's platinum guard.

The frame for supporting the tube, &c. consists of a polished mahogany slab, four inches broad and thirty-eight inches long, at the bottom of which is fixed a horizontal bracket which supports the cistern. Another bracket is placed at a height corresponding with the lower part of the brass tube attached to the barometer tube, against which it is clamped. The tube thus standing out from the board three inches, admits of inspection throughout its whole surface without removal.

Fastened to the frame, is a brass plate, on which are engraven the correction for capillary attraction; a table for reduction to the standard temperature 32°; and a correction for error in micrometer screw. This error of the screw, from uncontrollable circumstances, I could not avoid at the time of construction, but the correction may be rendered unnecessary hereafter, by the substitution of a new screw, and re-graduation of the scale; the error is attended, however, with no other evil, than the trouble of applying the correction.

The whole instrument is covered by a glass case to protect it, when not in use, from all needless fingering. The mercury used was prepared by distillation; ten pounds of mercury of commerce, of specific gravity 13.619, were put into an earthen retort, together with some copper and iron wire, as recommended by Mr. Faraday, and 8.5 lbs. were distilled over, the specific gravity of which was 13.625. This product was re-distilled in the same manner, and 7.5 lbs. driven over; which gave a specific gravity 13.628. It was then carefully dried and well filtered.

The necessity of recording the specific gravity of the mercury I think has been somewhat overlooked: but when it is recollected that the difference between 13.625 and 13.626 in specific gravity would be attended with a variation of 0.0022 inch in the altitude of a column of thirty inches, its importance is manifest.

The specific gravity of the mercury in the standard barometer of the Royal Society, as ascertained by Mr. Faraday, is 13.624, which would create a discrepancy of near 0.009 inch in absolute altitude between that instrument and mine, the barometer standing at thirty inches.

Faraday, Turner and others, give the specific gravity of mercury at 13.568, and if mercury of this weight should be used in the construction of a barometer it would give rise to a difference of over one-tenth of an inch between such an instrument, and that of the Royal Society and the one now described. The specific gravity of the mercury if given, however, at the time of construction, admits of an easy correction for the purposes of comparison.

After introducing the mercury into the tube, it was well boiled throughout its whole length.

The measurement for the scale was laid off from a standard mean yard, traced by Mr. Hassler.

For the utility of the application of the platinum guard, I must refer to the interesting Essay of Professor Daniell on the deterioration of barometers, as simply to state the facts connected with this subject, would occupy too much space in this description.

The adoption of the micrometer reading of the scale, I think will be found convenient, particularly for observers unpractised in the use of the vernier in finely graduated instruments.

On proposing the application of the glass plate as a horizontal boundary for the surface of the mercury of the cistern, although satisfied myself that no appreciable interference with the free flowing of the mercury would arise from it, in the measurements I had selected, it was thought by some of the Committee that such might be the case. After completing the arrangement, however, I was gratified by finding on reference to Dr. Young's Natural Philosophy, that the principle had before been suggested, and that he considered it free from error, provided the distance between the surfaces in contact with the mercury was not less than one-seventh of an inch. It will be recollected that I had adopted a distance rather greater, one-sixth of an inch. I am not aware that the plan was ever before put in practice, but considering this good authority, I felt justified in so doing.

Feeling much honoured by your confidence,

I am your obedient servant,

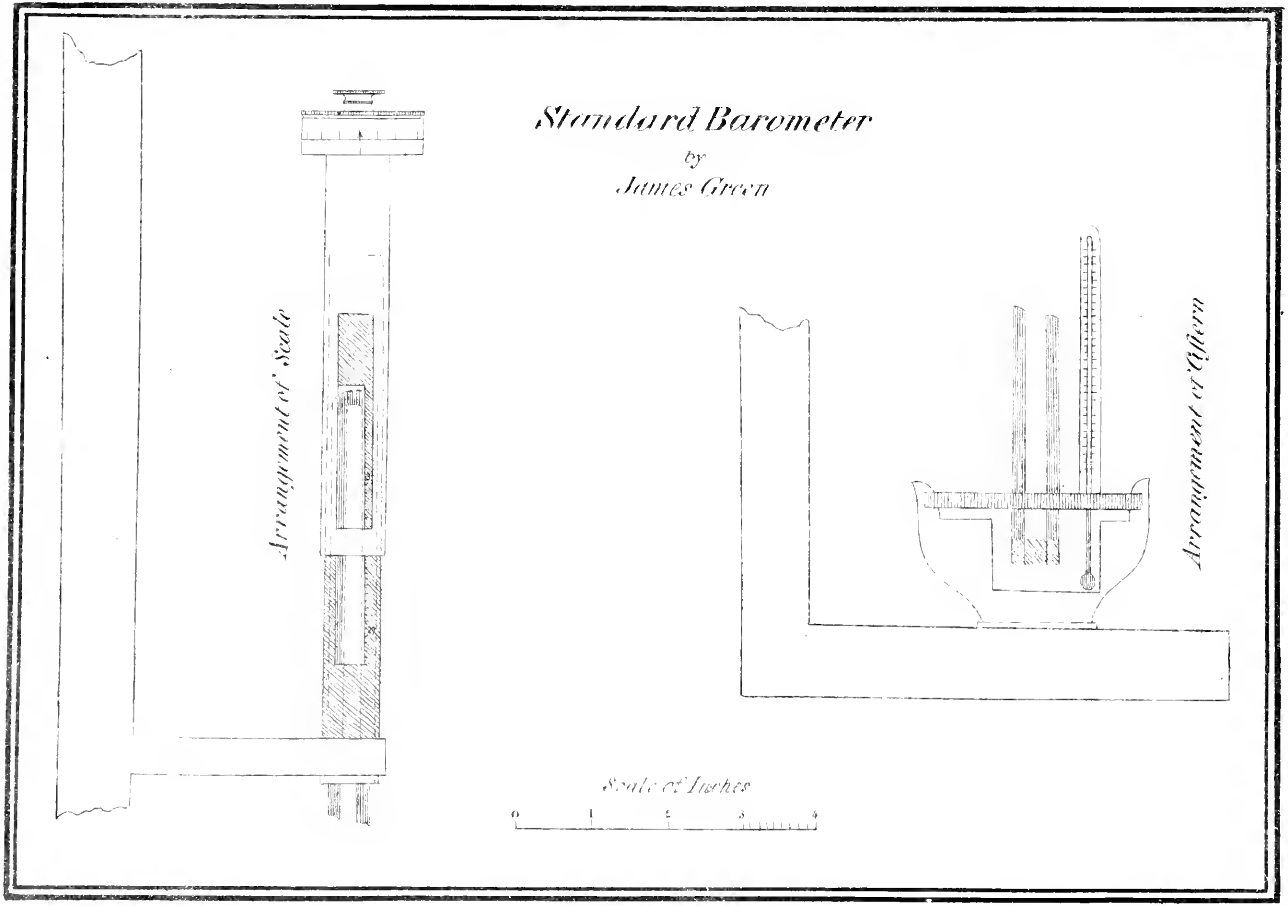
JAMES GREEN,

Philosophical Instrument Maker.'

The comparative thermometric observations were very simple. The bulb of one of the thermometers being surrounded with a piece of muslin, was a few minutes before each observation immersed in water, which had been allowed to acquire in standing the temperature of the atmosphere. This thermometer together with a dry bulb was suspended, and gently swung until the mercury became stationary. The stand of both thermometers was then noted, and recorded in the table.

The Committee present herewith a Table which they have calculated, exhibiting the amount of correction necessary for variations of temperature, applied to different heights of the barometric column. The calculation has been based upon the *apparent* dilatation of mercury in *glass* and not the actual dilatation of mercury only, because in our case the scale is fixed to the glass and of course partakes of its variations.

LEWIS BRANTZ,
JAMES GREEN,
J. H. ALEXANDER,
WILLIAM R. FISHER,
Committee.



Standard Barometer
by
James Green
Arrangement of Scale
Arrangement of Cistern
Scale of Inches
0
1
2
3
4

CORRECTIONS FOR TEMPERATURE.

All the tabular quantities *below* the mean of 32° are *additive*, all *above* are *subtractive*.

THERMOM'R.	BAROMETRIC COLUMN.							
	28 in.	28 in. 5	29 in.	29 in. 5	30 in.	30 in. 5	31 in.	31 in. 5
Fahren. 0°	0.076817	0.078171	0.079561	0.080933	0.082304	0.083676	0.085048	0.086419
5°	.064814	.065972	.067130	.068287	.069444	.070602	.071759	.072916
10°	.052811	.053755	.054698	.055641	.056584	.057528	.058470	.059413
15°	.040809	.041538	.042267	.042995	.043724	.044453	.045182	.045910
20°	.028807	.029321	.029835	.030350	.030864	.031379	.031893	.032407
25°	0.016804	0.017103	0.017404	0.017704	0.018004	0.018304	0.018604	0.018904
30°	.004801	.004888	.004973	.005058	.005144	.005230	.005315	.005401
35°	.007202	.007330	.007459	.007587	.007716	.007845	.007973	.008102
40°	.019204	.019547	.019890	.020233	.020571	.020919	.021262	.021600
45°	.031207	.031764	.032322	.032879	.033436	.033994	.034551	.035108
50°	0.043210	0.043981	0.044753	0.045525	0.046296	0.047068	0.047839	0.048611
55°	.055213	.056199	.057184	.058170	.059156	.060142	.061128	.062114
60°	.067215	.068416	.069616	.070816	.072016	.073217	.074417	.075617
65°	.079218	.080633	.082047	.083462	.084877	.086291	.087708	.089120
70°	.091221	.092850	.094479	.096108	.097737	.099366	.100994	.102623
75°	0.103224	0.105067	0.106910	0.108753	0.110597	0.112440	0.114283	0.116127
80°	.115226	.117283	.119341	.121400	.123457	.125515	.127570	.129630
85°	.127230	.129501	.131773	.134045	.136316	.138586	.140860	.443433
90°	.139230	.141718	.144205	.146690	.149177	.151664	.154150	.156637

METEOROLOGICAL OBSERVATIONS

MADE BY THE

MARYLAND ACADEMY OF SCIENCE AND LITERATURE,

On the 21st and 22d of June, 1836, at their Rooms, Baltimore, Lat. 39° 17′ N. Long. 76° 36′ W. Height of Barometer cistern 53ft.412 above mid-tide.

HOURS.	BAROMETER.	EXT. THERM'R.		WINDS FROM	CLOUDS TO	STRENGTH OF WIND.	REMARKS.
		DRY.	WET				
June 21.							
6 A.M.	29,722	63°	60.5	N. E.		Light.	Rain.
7	29,732	63	61	"		"	"
8	29,747	63	61	"	S. W.	"	Cirro-cumulus.
9	29.742	66	63	"	W. S. W.	"	Cumulo strati.
10	29.744	69	65	N. N. E.	S. S W.	"	" "
11	29,754	71	66	N. E.	Still.		Cirro-cumulus.
12	29 750	73.5	67	S. E.	E. S. E.	None.	Cirrus.
1 P.M.	29,744	74	67.5	"	W.	Light.	"
2	29,743	72	66	E. S. E.	W. N. W.	"	Cumuli.
3	29,749	69	64	E. by S.	W.	Moderate.	"
4	29,763	69	65	N. E.	W. by S.	"	"
5	29,756	67 5	64	E.	W.	"	"
6	29,768	66	63	N. E.	S. W.	"	Cirro-cumuli.
7	29,780	64	61.5	"	"	"	Cumuli & Cum. Strati.
8	29,806	63	61	"	S. E.	"	Cumuli.
9	29,827	63	61	"	"	"	" Rain.
10	29,831	62.5	61	"	"	"	Nimbus, "
11	29.827	63	61	"	"	"	" "
12	29,831	63	61	"	"	"	" Cum. Strati.
1 A.M.	29,837	62	60.5	"	"	"	"
2	29,838	62.5	61	"	Still.	Light.	"
3	29,836	62.5	61	"	"	"	"
4	29,847	61 5	60	"	"	"	" Rain.
5	29,865	60.5	59.5	"	"	"	"
6	29,874	64	61.5	"	"	"	"
7	29,894	61	60	"	"	"	" Rain.
8	29,893	63	61	E.	W.	"	" "
9	29,881	64	61.5	"	"	"	Cumuli.
10	29,900	64	61.5	"	W. N. W.	"	Cumulo-strati.
11	29,902	69	63 5	"	"	"	Cirro-cumuli.
12	29,900	71	65	E. S. E.	W. N. W. lower E. N. E upper.	"	Cumuli.
1 P.M.	29,895	71 5	64.5	S. E. by E.	W. N. W.	Moderate.	"
2	29,895	72	66	"	W. N W. lower S. E. upper.	Light.	Cirrus.
3	29,888	70	64	S. E.	N. W.	"	Cumulo-stratus.
4	29,880	72	65	"	"	"	Cirro stratus.
5	29,869	71.5	64.5	"	N N. W.	Moderate	" "
6	29,870	69.5	64	"	"	"	" "
Mean,	29,821	66 37	62.80				

The Barometer readings are corrected for capillary attraction, and reduced to 32° Fahrenheit.

METEOROLOGICAL OBSERVATIONS

MADE BY THE

MARYLAND ACADEMY OF SCIENCE AND LITERATURE,

On the 21st and 22d of September, 1836, at their Rooms, BALTIMORE, Lat. 39° 17′ N. Long. 76° 36′ W. Height of Barometer cistern 53ft.412 above mid-tide.

HOURS.	BAROMETER.	EXT. THERM'R. DRY.	EXT. THERM'R. WET.	WINDS FROM.	CLOUDS TO.	STRENGTH OF WIND.	REMARKS.
Sept. 21.							
6 A. M.	30.083	71°.5	67°	N. N. W.	S. S. E.	Light.	Nimbus.
7	30.088	71	65	N. N. E.	S	"	Cumulo-stratus.
8	30.107	71	65	N. E.	Station'y.	"	Cumuli.
9	30.109	71	65	"	"	Moderate.	" Rain, sprinkle.
10	30.113	72	64	"	"	"	Cumulo-stratus, overspread.
11	30.121	70	64.5	N. N. E.	"	"	Nimbus, heavy rain.
12	39.120	66	64	N. E.	"	"	" Rain continues, lighter.
1 P. M.	30.115	66	64	"	"	"	" " " "
2	30.101	68	64	"	"	"	Cumulo-stratus, overspread.
3	30.090	68	64	"	"	Very light	" thin.
4	30.084	70	64	"	"	"	" "
5	30.086	69	64	"	"	"	" overcast.
6	30.096	67	64	N.	"	"	" "
7	30.116	66	63	"	"	Brisk.	" "
8	30.124	66	63	"	"	Light.	Strati, overcast.
9	30.110	67	63	"	"	"	" "
10	30.106	66	63	"	"	"	" "
11	30.103	65.5	62.5	"	"	Moderate.	" "
12	30.106	65.5	62.5	"	"	Light.	" "
1 A. M.	30.107	66	63	"	"	"	Cumuli.
2	30.091	65.5	63.5	"	"	"	"
3	30.090	65.5	63.5	"	South'd.	Brisk.	" overcast.
4	30.091	66	63	"	"	Moderate.	" "
5	30.088	65.5	63.5	"	"	"	" "
6	30.089	66	64	"	"	"	" "
7	30.084	67	64	"	"	"	" "
8	30.087	68	65	N. E.	"	Light.	" deep overcast, drizzle.
9	30.085	69	67	"	"	"	" " " "
10	30.082	72	68	"	"	"	" overcast.
11	30.070	73	69	S. E.	Station'y.	"	" "
12	30.052	73	70	"	"	"	" "
1 P. M.	30.017	75	71.5	S. S. W.	N. E.	"	" "
2	30.004	76	72	S. W.	"	"	Cumuli, overspread.
3	29.977	78.5	72.5	"	"	"	Cumulo-stratus.
4	29.973	78	72.5	"	"	"	Cirro-stratus.
5	29.970	77	73	"	"	"	"
6	29.964	75	72.5	"	S. E.	"	"
Mean,	30.078	69.04	65.74				

The Barometer readings are corrected for capillary attraction, and reduced to 32° Fahrenheit.

METEOROLOGICAL OBSERVATIONS

MADE BY THE

MARYLAND ACADEMY OF SCIENCE AND LITERATURE,

On the 21st and 22d of December, 1836, at their Rooms, BALTIMORE, Lat. 39° 17′ N. Long. 76° 36′ W. Height of Barometer cistern 53ft.412 above mid-tide.

HOURS.	BAROMETER.	EXT. THERM'R. DRY.	EXT. THERM'R. WET.	WINDS FROM.	CLOUDS TO.	STRENGTH OF WIND.	REMARKS.
Dec. 21.							
7 A. M.	29.592	51°.5	47°.5	S.	N. E.	Very light.	Rain.
8	29.609	51	44.5	"	"	"	"
9	29.669	44	39	N. W.	E.	Very strong.	"
10	29.738	41	36	"	"	"	Nimbus.
11	29.802	40	30	"	"	"	"
12	29.829	36	16	"	N. E.	Strong.	"
1 P. M.	29.879	39.5	14	"		"	Cirro-stratus.
2	29.894	35.5	12	"		"	Clear.
3	30.028	29.5	9.5	"		"	"
4	30.060	28	9	"		"	"
5	30.141	24.5	7	"		"	"
6	30.218	24	8	"		"	"
7	30.289	29	11	"		"	"
8	30.317	22.5	10	"		"	"
9	30.350	23	7	"		"	"
10	30.405	19		"		"	"
11	30.426	19		"		"	"
12	30.446	19		"		Light.	"
1 A. M.	30.457	16		"		"	"
2	30.508	16		"		"	"
3	30.527	14		"		"	"
4	30.533	10		"		"	"
5	30.564	14		"		"	"
6	30.577	14.5		"		"	"
7	30.586	16		"		"	"
8	30.629	15		"		"	"
9	30.677	16		"		"	"
10	30.711	17		"		Moderate.	"
11	30.699	18		"		"	"
12	30.672	19		"		"	"
1 P. M.	30.639	20		"		"	"
2	30.637	22		"		"	"
3	30.607	21		"		"	"
4	30.587	24.5		"		"	"
5	30 592	20		N. by W.		Light.	"
6	30.596	21		"		"	"
Mean,	30.414	24.72					

The Barometer readings are corrected for capillary attraction, and reduced to 32° Fahrenheit.

METEOROLOGICAL OBSERVATIONS

MADE BY THE

MARYLAND ACADEMY OF SCIENCE AND LITERATURE,

On the 21st and 22d of March, 1837, at their Rooms, BALTIMORE, Lat. 39° 17′ N. Long. 76° 36′ W. Height of Barometer cistern 53ft.412 above mid-tide.

HOURS.	BAROMETER.	EXT. THERM'R. DRY.	EXT. THERM'R. WET.	WINDS FROM.	STRENGTH OF WIND.	REMARKS.
March 21.						
7 A. M.	29.955	42°	40°	S. E.	Light.	Cumulo-stratus.
8	29.955	44	42	"		
9	29.969	49	45	"		
10	29.941	52	47	"		
11	29.939	54	48	"		
12	29.943	56	50	S. W.		Nimbus. Rain.
1 P. M.	29.939	55	51	"		
2	29.909	54.5	51	S. by W.		Cumuli. No rain.
3	29.895	52	50	"		
4	29.856	52	49.5	S. E.		Nimbus. Rain.
5	29.847	54	51	"		" with cirri. Rain.
6	29.836	54	51.5	"		
7	29.830	53.5	51.5	"		
8	29.832	54	52	S. W.		
9	29.791	52	50			
10	29.761	53	51		Moderate.	
11	29.719	52	50		"	
12	29.668	53.5	52		Light.	
1 A. M.	29.627	54	52.5	S. S. E.		Nimbus. No rain.
2	29.605	54	52.5	"		
3						
4½	29.540	52.5	51	"	Light.	Heavy rain.
5	29.556	54	52	"		
6	29.561	53	52	S. by E.		Cumuli. No rain.
7	29.578	55	53	S. W.		
8						
9	29.616	53	48	N. W.	Moderate.	
10	29.659	49	43	"	Strong.	
11	29.688	46	40	"		Stratus.
12	29.720	47.5	40	N. N. W.		Stratus. Nimbus. Rain.
1 P. M.	29.725	45	40.5	N. W.		Cumulo-stratus. Spiculæ of snow. Breaking away.
2	29.738	43	37	"		
3	29.751	43	37	"		
4	29.769	41	35	"		
5	29.802	40	34	"		
6	29.805	41	35	"		Cirro-stratus. Nimb. Spiculæ of snow.
Mean,	29.774	50.22	46.62			

The Barometer readings are corrected for capillary attraction, and reduced to 32° Fahrenheit.

ARTICLE X.

Directions for preparing specimens of Natural History.

Issued by the Maryland Academy of Science and Literature.

QUADRUPEDS.

In preparing quadrupeds the object in view is to preserve the skin entire, with the other parts that characterize the species—such as the head with the jaws and teeth—the legs with the hoofs and claws.

For this purpose an incision should be made along the middle of the belly, commencing a little below the space between the fore legs and ending at three-fourths the distance between that and the root of the tail. The skin is then dissected up on each side as far as the legs, which must be disjointed from the body. The neck must be drawn out and cut off close to the skull, over which the skin must be stripped. All the soft parts are then to be removed from the skull, both externally and internally, such as the muscles of the jaw—the eyes—the tongue and the brain. The legs are to be drawn out as far as possible and cleaned in a similar manner: each as well as the skull being again returned into the skin, to insure the preservation of which every portion of flesh or fat must be entirely removed from it. The skin must then be well rubbed in every part with the white oxide of arsenic, a portion of which should also be thrown into the cavities of the skull and the sockets of the eyes. If the arsenic cannot be procured, corrosive sublimate in solution (3 oz. to a gallon of spirit) may be substituted. Small animals may be preserved in spirits of wine.

For transportation, the skin, if practicable should be lined with thick paper—the body folded flat—the legs turned inwards across the body—and the whole rolled up, commencing at the head. If the animal be not larger than a cat, it would be far preferable to merely lay the legs across, and pack the skins one upon the other, as this would tend to prevent any distortion, which should in all cases be carefully avoided. When the fur is very thick or many skins are packed together, the arsenic in the skin is not always a safeguard against insects, as a precaution in such cases, powdered camphor may be sprinkled between them.

It is well here to mention that there are certain necessary precautions to be observed under this as well as under the succeeding heads. The animal selected, if there is a choice, should be well developed—of an adult age (the young also when the age is known are useful,) should have all the parts which furnish characteristics to the species perfect, the skin free from abrasions and from spots of blood and dirt. These last may with care be removed, and if the animal be a scarce one and it be desirable on that account to preserve it, some of these defects may be remedied by artificial means.

BIRDS.

The last paragraph though applicable to all animals, is peculiarly so to birds. These should be preserved in full plumage, and having the feathers of the wings and tail as perfect as possible.*

Taking hold of the feet of the bird and permitting the head to hang downward, gently compress the abdomen and neck, so as to empty the stomach and craw of any fluid matter they may contain, and then fill the throat with cotton. Separate the feathers of the abdomen carefully along the middle of the body and commencing a little above the lower edge of the breast-bone, make an incision large enough to take the body out, which by practice may be accomplished through a very small opening, which is preferable. In making the incision it must be remembered that the skin of birds is generally very thin, and care should be taken not to penetrate the muscles of the abdomen or viscera. The incisions may also be made under one of the wings, which is thought by many to be a much more convenient place, and it is certainly better concealed than in the former. The skinning is continued to the legs,

*In shooting birds for the purpose of stuffing them very small shot should be used, and in very small loads. A quantity of cotton should be provided to fill both the throat and the wound. The latter if very small may be dusted with powdered rosin or chalk, which will absorb the blood and prevent its soiling the plumage. Each specimen ought to be separately wrapped in soft paper and deposited in a basket, as the usual game bag is very liable to break the feathers and distort the bird.

which must be disjointed from the body, and to the tail, the bone of which must be cut off, carefully cleansed and left attached to the skin. The body can now be drawn out so as to get readily at the wings, which are also to be disjointed. The neck is then drawn out and the skinning continued to the root of the bill. The eyes as well as all the soft parts of the head are next to be cleaned, taking care not to burst the former which would discharge the fluid they contain and injure the feathers. The neck is cut off close to the head, which is then drawn back into its natural position. This latter object is sometimes difficult to accomplish in birds having long slender necks unless a string of sufficient length be first attached to the bill, by which the head can readily be drawn back. In birds having large crests as this process is impossible without injuring them, an incision must be made in the back of the neck and the head cleaned by that means. The bones of the wings and legs are next to be freed from the flesh, and the whole skin and skull, &c. &c. rubbed with arsenic as previously directed. In cleaning the bones of the wings of large birds it is generally difficult to draw them out of the skin, when this is the case an incision must be made along the under part of the wing, for the purpose of removing the flesh. The bird must lastly be filled with tow or raw cotton, inserting it with fine pincers into the neck and sockets of the eye, &c. The wings are then folded, the neck, legs and tail extended, the feathers smoothed and laid straight or washed with warm soap and water if necessary, and the bird dried.

When dried they can easily be packed, rolling each in a separate piece of paper and sprinkling powdered camphor in the box.

It is desirable to have both male and female with the nest and eggs, and also the young ones when the age can with certainty be told. It is also well to know at what season of the year the specimen was killed, as many birds change their plumage during the course of the year. Eggs are preserved by making a small hole at each end and blowing out the contents.

REPTILES.

Small snakes, lizards, frogs, &c. are best preserved in spirits. Large snakes and lizards are most conveniently transported in spirits, but may afterwards be stuffed. *

With tortoises the skin should be separated from the lower shell all around, and the shells sawed apart each side; the skinning and stuffing is then easily effected. The upper shell should be slightly oiled but not varnished.

FISH.

Are most readily prepared for transportation by simply wrapping each specimen in muslin and putting them in spirits, taking care not to pack them in such a manner as to distort their shape. A piece of sheet lead may be attached to each, having a number stamped upon it, as a reference to any written remarks which may accompany it.

In stuffing those fish which have no scales, a slit may be made in the belly, and with a little dexterity the head and tail may be successively drawn out, taking care to preserve the head, gills, fins and tail. The skin can then be filled according to its size with bran, saw-dust, tow, cotton or straw. The fins and tail must each be spread out on a piece of card or thin board until dry, and the same precautions in preserving the skin from attacks of insects used as before.

Fish having scales should be skinned by making an incision along *one side* of sufficient length, and the body removed carefully so as not to bend or wrinkle the skin of the other side, which would deprive it of its scales. The incision, if the skin is sufficiently strong may be sewed up, or if not, may be closed by pasting a piece of bladder or muslin over it, which, as but one side is intended for exhibition will not disfigure the specimen.

*In the collection of the Maryland Academy, the snakes and small lizards are, at the suggestion of Dr. William Ed. Coale, enclosed in glass tubes filled with spirit and hermetically sealed at each end. In this way the specimens have a very neat appearance, besides which the minute characteristics of the species, the length, number and shape of the scales, &c. &c. can be more readily studied, and there is of course no evaporation of the spirit.

INSECTS.

Hard shelled insects, such as beetles, as well as flies, grasshoppers, &c. merely require to be pierced with a pin through the right *elytron* or wing case, and stuck in a box. Butterflies should be caught with a net in such a manner as not to deprive the wings of the down which covers them. In preserving them, two specimens are desirable so as to exhibit both surfaces of the wings, which should be kept extended.

When insects are preserved in a box the sides should be plentifully daubed with turpentine and a large lump of camphor be put into each box. As another precaution, a quantity of arsenic may be mixed with the turpentine.

Spiders, centipedes, worms, and all soft insects are best preserved in spirits.

SHELLS.*

Shells may be collected in great plenty and variety on the shores of most continents and islands; but after having lain there for any considerable time divested of the animal, they become broken and lose their colour, and of course are less valuable; choose therefore only such as are complete of their kind, and not corroded by worms; which are generally those having the live animals in them, or those recently thrown upon the shore by the sea. The animals may be killed by putting them into boiling water, after which each must be extracted from its shell, unless very small, reserving its operculum or cover which closes up the mouth: this, however, does not exist in every species. The shells, especially those from the sea, should then be soaked in fresh water, afterwards well dried; then wrapped up carefully in soft paper or bran, and packed in a box, leaving no room for shaking. Many kinds of shells live out at sea, and never approach the shores; others fix themselves to the bottoms of ships, old timber, turtles, &c. These are generally the most rare and valuable, and may be procured by trailing, or with scoop-nets, among the rubbish, sea weeds, &c. that are frequently found floating on the ocean.

* The three following articles on shells, starfish and sea eggs, as well as on minerals and all that follows, are copied from the instructions issued by the Philadelphia Academy of Sciences, which have also been liberally used throughout.

Rivers of all countries abound in *fresh water shells:* these are much sought after, and are easily taken. Their preservation requires the same process in all respects as sea shells.

The same remarks will apply equally well to *land shells*, of which varieties are found almost every where.

Of bivalves, or those having two shells, it is important to obtain both valves. The natural skin peculiar to many kinds of shells, should not on any account be taken off, but may be kept in its natural state by being rubbed with a little oil; nor should the shells be touched with acids, as they are spoiled by them. It is also desirable to have a shell of each species, *containing the animal*, which may be kept in spirits.

Corals, sea-fans, &c. may be simply washed in fresh water and dried in the shade.

STAR-FISH.—(*Asterias.*)

Must be washed in fresh water, and dried in the shade.

SEA-EGGS.—(*Echinus.*)

Must be washed in fresh water, punctured around the mouth, which is beneath, with a pen-knife, dipped into a pretty strong solution of corrosive sublimate and spirits, dried in the shade, and packed in cotton or bran to protect the spines from being broken.

In addition to the specimens above enumerated, it is particularly desirable to have whole skeletons of different quadrupeds, birds, reptiles and fish, and if this is not practicable the skulls, *the pelvis* or haunch bones, the feet, specifying whether the fore or hind feet and the wings are valuable, and it frequently happens that an animal may be too much soiled or disfigured for stuffing, while some or all of these parts may be obtained from it. To clean the separate bones it is merely necessary that they should be boiled so as to soften the meat which is then readily scraped off, during which process care must be taken not to break off any delicate points of bone. In preserving whole skeletons, the skull and bones of the neck and tail as well as the *large* bones of the extremities may be prepared in the above manner, but the ribs and back bone should be cleaned as much as possible with a knife *only*, and not separated. A little arsenic rubbed upon them will prevent smell from the flesh remaining attached, and after they are received at the academy they can be further cleaned and mounted.

The stomach and intestines should be first emptied, and after putting arsenic into them be blown up, and varnished. The windpipe must be stuffed with wool or left attached to the tongue and preserved in spirits.

PLANTS.

1. The first direction to be given to the botanist is to *collect every thing*, even plants regarded as mere weeds. Those not higher than twelve inches should be preserved entire, branches and root; larger plants must be cut or in some cases doubled; and of plants still larger a specimen from parts bearing the flowers with some leaves from the stem or root, will be sufficient. Specimens of the most common height, habit and appearance, are to be selected, rejecting both dwarfs and monsters; while characteristic individuals constituting *varieties* should be collected. Generally plants should be gathered when the flowers are most perfectly developed, but some which soon shed their petals must be gathered when not fully expanded, that they may open by the time you are prepared to preserve them. Of the umbelliferous plants, the genus carex and some others whose seeds have distinguishing characteristics, specimens should also be gathered when their seeds are fully grown, but not so ripe as to fall. Also curious fruits may be dried by laying them in the sun, and afterwards kept in drawers with the cones of firs, &c.

2. The process of drying plants is simply this: place them between layers of ten or fifteen thicknesses of unsized paper, as old newspapers, place the pile between two boards and subject them to pressure, eight or ten bricks or a few large paving stones will be sufficient; or a lever press which keeps the pressure constant; are either of them preferable to a screw press. The papers must be changed for others perfectly dry, once or still better twice a day, until free from moisture; requiring from one to three days, and for some succulent plants as many weeks; while others may be removed from the parcel as they become dried. The plant must be spread out in its natural position, whether erect or drooping, whether

the stem be straight or tortuous, and the parts placed so as to be as little confused as possible. Where leaves or flowers are very crowded, or where a number of stems arise from one point and interfere, some may be removed, so as to preserve and exhibit the remainder more perfectly. In very large and succulent stems it is sometimes necessary to pare off the under half, or split them in two and press the halves separately, with their attached leaves, &c. Some flowers also as the thistle are hard and unyielding and require to be divided, and the parts pressed separately. To destroy the vegetating principle of some plants, which resists even the action of a powerful press, and to dry them more quickly they may be dipped into boiling water and wiped before being placed in the papers.

MINERALS, PETRIFACTIONS, &c.

Specimens of minerals may be collected in every soil, and are preserved with the greatest ease, nothing farther being requisite in general, than to detach masses from any rocks you may meet with, and put them by. Delicate specimens, such as crystals, or those procured from mines, should be protected from injury by wrapping each in a parcel of paper, tow, &c.

Petrifications of all kinds may be preserved in a similar manner: also specimens of the rocks composing canal districts, canal routes, mountains, or particular sections of country.

All other natural productions not particularized, will be valuable acquisitions to the academy, and in general are easily procured and preserved, and we would here recommend you not to be deterred from bringing any object from the circumstance of its being '*very common*;' but would rather advise you to preserve every natural curiosity that you may meet with, as particular characters which are interesting to the naturalist very frequently escape the notice of casual observers. Specimens the most common are particularly desirable from the western coast of America, and other countries little explored, and the most familiar productions of our own State, should there already be a sufficient number in possession of the academy, are very valuable as means of exchange for foreign specimens.

It is a material object, and the particular desire of the academy, that every information which can be gained respecting the specimens presented, should accompany them; as regards the climate, soil, locality, and other peculiarities.

The government of the United States having withdrawn all restrictions on the importation of objects of Natural History, there will be no difficulty at the custom-house.

ARTICLE XI.

On the Metallic Coating for Electric rubbers. By William R. Fisher.

[Read before the Academy, March, 1836.]

There are two compounds generally employed for this purpose, the bisulphuret of tin (commonly called mosaic gold) and an alloy of tin, zinc and mercury, (known as amalgam.) The former when it can be obtained, is generally preferred on account of its laminated structure; being unctuous, soft and adhesive, but the preparation of it being attended with difficulties, and its higher price, have induced many persons to employ the latter, which is much cheaper and more readily made. I shall endeavour, however, to describe the process by which the former is procured, so that its successful manufacture may be pretty confidently relied upon. It is made by mixing two parts per oxide of tin, two parts of sulphur, and one part muriate of ammonia, all finely powdered until they are thoroughly diffused through each other. This mixture is then put into a Florence flask, which is buried in sand, in a Hessian crucible, up to the neck—the crucible is then exposed to a red heat for several hours, until the full reaction of the materials has taken place, and the bisulphuret of tin is formed; this may be known by introducing an iron rod into the flask, frequently during the operation, and noticing the appearances indicated upon it, when withdrawn. Until the sulphuret is formed, the rod when withdrawn, is merely covered with sublimed sulphur, but so soon as the mosaic gold begins to form, the rod is found beautifully spangled with crystals of a bright golden colour, and as the formation proceeds, the crystals are found to extend higher up upon the rod. During the process a considerable portion of the sulphur is sublimed and escapes. The period for withdrawing the crucible from the fire is known by the sublimation of the sulphur ceasing and the depth of the crystalization upon the rod, when withdrawn. The great difficulty it occurs to me, is to avoid giving too high a heat—by carefully watching and regulating the heat I have succeeded in obtaining a sulphuret, admirably adapted for electrical rubbers. This which is now submitted was prepared in two hours. If the crucible be allowed to cool very slowly, much more brilliant crystals are procured having all the lustre and beauty of gold. This process is evidently a great improvement over the old method which required several hours for its completion. I have generally used an open furnace for this preparation, and have succeeded in regulating the heat of a charcoal fire without difficulty. Dr. Edmondson informs me that he succeeded with a spirit lamp, in obtaining some very fine mosaic gold, and I have seldom seen handsomer than that which he employs. The smaller crystals are more mutuous and adhere more readily to the rubbers than the larger, which enables us to present a greater surface of metallic coating to the cylinder or plate, they are consequently preferable for electrical purposes.

The Amalgam, used as a substitute for mosaic gold, is made from two parts mercury, one part tin, and one part zinc. The zinc is first melted in an iron ladle or crucible, the tin then added, which readily fuses in the melted zinc, and then the mercury. The proportions of this mixture are such as to form a crystalized alloy or amalgam, when the melted mass is poured out upon a sheet of iron or other cooling incombustible. To avoid misapprehension, it seems proper to add, that neither of the mixtures described, is original with myself. The former is from Turner's Chemistry, and the latter from Brewster's Encyclopedia, Art. Electricity. It is recommended by Baron Keinmayer, who found that with the common amalgam, he could charge a Leyden vial having $1\frac{1}{3}$ square feet of coated surface with ten revolutions, whereas, with the amalgam which he recommends, he required only six. A battery consisting of 53 square feet of coated surface, required 250 revolutions with common amalgam, whereas with the new amalgam, 150 revolutions were sufficient. This amalgam is used by triturating it in a mortar and mixing it with lard.

The annexed extract from the report of my friend, Mr. Jas. Green, to whom was referred the determination of the relative values of these two substances as promoters of electrical excitement, will enable experimenters to judge for themselves of the comparative advantages of each. After detailing the mode of experimenting, Mr. Green's report proceeds:

'In that condition of the atmosphere most favourable for electrical excitation, I could discover no difference in the amount of the effect produced by the two substances: but in a moist and unfavorable condition of the air, I found the effect greatly in favour of the amalgam. This difference augmenting with the difficulty of producing electrical development.

'The advantages attending the use of the bisulphuret of tin over the ordinary amalgam, are, however, so great, that I think it in common application, the most acceptable material. Every one accustomed to use the electrical machine must have felt the trouble attending the use of amalgam, particularly if the machine has been idle for any length of time: the surface of the rubber becomes hard and requires more or less labour to put it in fit state for use, the cylinder or plate becomes occasionally streaked and greasy, which holds the dust tenaciously, and then the trituration of the amalgam upon every application is somewhat troublesome. Now, these inconveniences do not attach to the use of mosaic gold, it adheres to the rubber without lard, does not streak the glass and is readily renewed on the rubber, by rubbing a lump over its surface, or by spreading it over with powder. These advantages, with its superior neatness, render it admirably adapted for the larger class of electrical machines.'

ARTICLE XII.

Transactions of the Maryland Academy of Science and Literature.

1836.—At the sitting January 1st, the officers elected for the present year are

P. Macaulay, M. D. *President.*
E. Geddings, M. D. } *Vice-Presidents.*
P. T. Tyson, }
D. Keener, M. D. *Treasurer.*
J. I. Cohen, M. D. *Librarian.*
Wm. R. Fisher, *Secretary.*
A. B. Cleaveland, M. D. }
Geo. W. Andrews, } *Curators.*
Geo. Frick, M. D. }
James Green, }

January 14.—A series of specimens of zinc ore, were received as a donation from Mr. J. Hitz, which were referred to Mr. P. T. Tyson for examination. Dr. Geddings delivered a lecture upon the respiration and circulation of fishes, which he illustrated by drawings, preparations and dissections. A committee was appointed to prepare a system of classification, by which the various departments of the sciences may be assigned to the members according to some fixed order.

January 28.—The following system of classification, was reported by the committee, charged with that duty at the last meeting, and adopted, and the members were subsequently assigned to each class respectively, by the president. It is expected that every member will enroll himself under one class at least, but he may co-operate with as many of the classes as inclination will permit. Each class is considered a standing committee, upon the particular department of natural science, whose title it bears, and all communications and specimens submitted to the Academy are to be referred to that class, having particular cognizance of the subject.

1st Class.—Mathematics, astronomy and physics, the latter including natural philosophy and mechanics.

2d Class.—Chemistry.

3d Class.—Mineralogy and geology, including physical geography and the history and classification of fossil remains.

4th Class.—Zoology, embracing the comparative anatomy and physiology of animals. This class is further divided into six sections, viz:

1. History and classification of mammalia.
2. " " birds.
3. " " reptiles.
4. " " fishes.
5. " " insects, including crustacea.
6. " " mollusca, including conchology and the zoophytic productions.

5th Class.—Botany, including vegetable physiology.

The first named member of each class, is chairman of that class, and at present the chairmen are, 1st class, B. H. Latrobe; 2d class, J. T. Ducatel, M. D. 3d class, P. T. Tyson; 4th class, E. Geddings, M. D. 5th class, W. E. A. Aikin, M. D.

A paper was received from T. Phillips Allen, corresponding member, residing in North Carolina, 'on the chemical composition of the Prussian blue of commerce,' which was read and referred to the section of chemistry.

The following donations were received and referred to the different sections, viz. From Prof. Ducatel, a circular steel plate, marked with various colours, by the agency of galvanism, by M. Nobili of Florence, referred to section 1st.—From Dr. J. R. W. Dunbar and Dr. Edward A. Worrell, a cougar (*Felis concolor*,) prepared by them; referred to section 4th.—From Dr. P. Macaulay, a fossil vegetable from the Virginia coal mines; referred to section 3d.

February 4th.—Donations were received and referred as follows: From Messrs. Alexander and Ducatel, a copy of their report on the new geographical and geological map of the state, for 1835; deposited in the library. From Dr. Macaulay, a series of minerals and fossils from the coal formation of Virginia, which having been examined and labelled, were referred to the curators to be placed in the cabinet. From Dr. Dunbar, two vols. of the Transactions of the American Philosophical society, deposited in the library. From Mr. Geo. W. Andrews, a copy of 'the Manual of the Practical Naturalist;' deposited in the library. From Dr. Geddings and Dr. Dunbar, a cougar; referred to section 4th.

A report on Mr. Allen's paper, read at last meeting, was received from Mr. Wm. R. Fisher, of the section of chemistry, which was read and ordered to be filed with the original paper. Professor Ducatel, gave a lecture on the chemical phenomena which occur during respiration, and offered some strictures on the explanation of that function, as described in 'the treatise on Vegetable and Animal Physiology, by P. Mark Roget, M.D.'

February 11.—Dr. W. E. A. Aikin deposited in the library, 'Rennie's Elements of Mechanics.' Mr. W. R. Fisher, read a lecture on 'the detection of arsenic, in medico-legal investigations,' which was accompanied by experimental illustrations, of many of the processes and phenomena described. Dr. T. Edmondson, Jr. reported a meteorological table for the month of January, 1836. Mr. Jas. Green, of the first section, made a report on the steel disc, referred to that section at a former meeting. The experiments of Mr. Green, had afforded him various brilliant colours, resembling in beauty and intensity, those produced by the process of M. Nobili, although not arranged with the same precision, in regular forms. The process of the author of this species of galvanic etching, has not been disclosed, but there is a prospect, that the continuance of Mr. Green's investigations, will enable him, if not to discover a means identically the same, at least to furnish a mode by which analogous effects may be produced. The report was accompanied by illustrations, exhibiting the manner in which the results obtained, had been produced. Mr. Green was requested to continue the investigation.

February 18.—Dr. Geddings presented to the library, a copy of 'Lea's observations on the genus Unio,' and a copy of 'Genera Crustaceorum et Insectorum,' by Latreille.

Professor Ducatel submitted to the Academy, a series of experiments under the direction of Mr. Nicollet, with a view to determine the magnetic intensity at this meridian. He described the manner in which the experiments were performed, and exhibited one of the instruments employed. This consists of a highly sensitive magnetic needle, suspended in a glass vessel, by a single strand of silk, perfectly free from any twist, so that no motion may be produced by the torsion of the silk. The intensity was determined by marking the time, during which any given number of vibrations was accomplished, through a given arc of amplitude; the temperature, barometrical pressure and direction of the wind, being noted. The consideration and further examination of the subject was referred to section first. Professor Ducatel, also presented a memoir on a system of meteorological observations, prepared by Mr. Nicollet, and submitted by him to the secretary of war, being the basis of the observations now being made at the different military and naval stations of the United States, by order of the government.

February 26.—Donations for the library, were received from Mr. Alexander and Dr. Geddings. From the former a copy of 'L'Histoire des Oiseaux d'Afrique,' by Levaillant, two vols. folio; from the latter, copies of 'Lehmann's Jungermania,' 'Baltimore Medical and Surgical Journal,' and 'North American Archives.' Mr. W. R. Fisher, read a short memoir on 'Amalgams for electrical machines,' and exhibited specimens of mosaic gold, and Baron Keinmayer's mercurial amalgam, prepared by the processes described in the paper; all referred to section first. Mr. Green exhibited some electro-magnetic phenomena, and accompanied the experiments with an account of the fact first observed by Mr. Ritchie, that the length of time during which an electro-magnet retains its armature, after the connection is destroyed, depends upon the length of its arms. A donation was received from Dr. Geddings, of a collection of southern plants; referred to section 5th.

March 3.—Donations of various books for the library were received from Professor Ducatel and Mr. Alexander; a diagram of the human eye from Mr. Green; a map showing the connection of the Baltimore and Ohio rail roads, with other rail roads projected and completed, from Mr. Fisher. Specimens were received for the cabinet from Mr. I. Tyson, Jr. chrome ore, in a matrice, said to be feldspar; from Mr. P. T. Tyson, a large specimen of asbestos, variety amianthus, obtained at the intersection of the Susquehannah rail road with the Gunpowder river; from Mrs. E. Geddings, a collection of southern plants. Dr. T. Edmondson, Jr. reported a meteorological table for February, 1836—referred to the section of physics, &c. A list of minerals was submitted by Professor Ducatel, at the request of the consul-general of France, which the government of that country is desirous to obtain—referred to the section of mineralogy. Don Ramon della Sagra, of

Spain, and F. R. Hassler, of Washington, were elected honorary members.

March 10.—Donations of American insects were received from Mr. Hazlehurst, and of Chinese insects from Mr. Fitzgerald, which were both referred to the section of zoology. Mr. P. T. Tyson, from the section of mineralogy, reported that the specimen of chrome ore, referred to that section at the last meeting, is in a matrice of magnesian carbonate of lime, the proper title of the mineral being ferro-oxide of chrome, in magnesian carbonate of lime. Mr. Tyson also reported that some of the minerals required by the French consul-general could be supplied from among the cabinets of several members.

March 17.—Numerous specimens for the cabinet were received from Messrs. Tyson, Webster, Geddings, and Hazlehurst; among them a specimen of anthracite, containing fossils, from Mr. Tyson. Donations for the library were made by Mr. Alexander and Mr. Green.

March 24.—M. I. Cohen, Esq. presented a collection of English birds, prepared under the direction of Mr. Audubon. Mr. P. T. Tyson presented a collection of shells, and Professor Ducatel a large number of minerals, fossils, shells, &c. Donations of books for the library were received from the President; and Professor Geddings, on behalf of Dr. Barnum, presented five South American birds. Mr. Green, from the section of physics, reported progress on the examination the specimens of amalgam for electrical rubbers.

March 31.—Donations for the library were received from Messrs. Alexander, T. A. Conrad, of Philadelphia, and J. E. Heath, of Richmond, and some specimens of coral and shells for the cabinet, from Mrs. Fisher. A letter was received from the New York Lyceum of Natural History, acknowledging the receipt of the Academy's circular, and proffering duplicate specimens for the cabinet. The secretary was directed to reply and acknowledge the gratification which this prompt offer to assist has occasioned. Dr. T. Edmondson, Jr. reported a meteorological table for March, 1836. Mr. P. T. Tyson gave a verbal account of the Ice mountain of Virginia, and suggested the probable cause of that singular phenomenon.

April 7.—Specimens of fossil bones, from Talbot county, in this state, were presented by Dr. A. H. Bayley—also an osprey, *falco haliœtus*, shot in the neighbourhood of this city, from Mr. Hazlehurst; several specimens were presented by Professor Geddings. The contributions to the library were a copy of 'Opinions on various subjects, by Wm. Maclure,' from the author; 'Synopsis of the Flora of the western states, by J. L. Riddell,' from Dr. Rogers; and a copy of the plates to Barton's Flora.

April 14.—Dr. Harlan, of Philadelphia, presented a copy of his 'Medical and Physical Researches;' Dr. James Eights, of New York, 'Report of the Regents of the University of the State of New York;' St. Mary's College of this city, 'Method of computing the observations of an eclipse of the sun,' published by the College; and Charles Cramer, Esq. of New York, several numbers of the 'Proceedings of the Imperial Mineralogical Society of St. Petersburg.' The library was also enriched by the receipt of fifty-nine numbers of the 'Iconographie du Regne Animal.'

April 21.—Numerous donations of books were received from Mr. E. Durand, of Philadelphia, and Dr. W. E. Coale; Dr. Edmondson presented six printed copies of the meteorological table for February last; Drs. Geddings and Riley presented for the cabinet a pair of flickers '*picus auratus*.' A communication in German, printed by order of the Prussian government, containing a method for the propagation and domestic breeding of leeches, was received from Baron de Roenné, Prussian Minister, read and ordered to be translated for the library.

April 28.—Specimens were received from Mr. Minifie and Dr. Riley; and from the Academy of Natural Sciences in Philadelphia, a copy of the notice of that Academy recently published by them. Dr. Geddings, chairman of the section of zoology, reported progress in his examination of the foreign and indigenous insects, referred at a former meeting. Mr. Fisher invited the attention of the Academy to a description of the aurora borealis, which was seen on the 22d of this month. The paper was referred to a committee of the section of physics, with instructions to collect all the observations and facts connected with its appearance in this city, and report to the next meeting. Dr. Geddings described the marine animal recently taken at Carpenter's point on the Chesapeake bay. The fish is described to be of the genus delphinus—subgenus, delphinapterus leucas—known as the beluga. Mr. Fisher presented for the use of the cabinet an alcholic solution of the arseniate of baryta, which has been highly recommended for the preservation of cabinet specimens, especially the plumage of birds. This salt was prepared by fusing together at a moderate heat in a sand crucible, in their atomic proportions, crystallized nitrate of baryta and arsenious acid, made into a paste with nitric acid. The process is simple, and attended with far less trouble and expense than when the ordinary process described in the books is employed. Mr. Quinby was appointed lecturer for the regular evening.

May 5.—Specimens were received from Dr. Keener, Dr. Geddings, Dr. Riley, Joseph King, Jr. Esq., and A. Trevallyn, Esq. of England; and a copy of the Statistical View of the United States, prepared under the direction of the Secretary of State, was transmitted by the Hon. R. H. Goldsborough, of the U. S. Senate. Joaquim José da Costa de Macédo, perpetual Secretary of the Royal Academy of Sciences at Lisbon, transmitted a copy of his treatise on the early Portuguese navigators. The same gentleman, in his official capacity, addressed a letter to the Academy, inviting correspondence with the Academy which he represents, and giving information that he had sent for the library the proceedings of the Royal Academy of Lisbon. These volumes have since been received, and form a valuable acquisition to the library. Sir Nicholas Carlisle was elected an honorary member. Dr. Geddings, from the section of zoology, reported a catalogue of the insects formerly referred to that section. Dr. Aikin, of the section of botany, reported progress in the arrangement of plants. Mr. Fisher, from the first section, reported as full an account as could be ascertained of the late remarkable aurora borealis, which was ordered to be published.

AURORA BOREALIS.

An unusually magnificent and brilliant display of this interesting phenomenon was observed in this city on Friday evening, April 22d. The appearance far exceeding any effort of which I am capable, of conveying by words an exact idea of the beauty and splendour of the scene; but in conformity with the wish expressed at the last meeting of the Academy, that a record of the fact should be preserved, and a description of its appearance recorded, I shall attempt to give such an account as may at least revive the recollection of it in the minds of those who saw it, though it fail, as it must do, to create a perfect image, which those who did not see it may consider a representation of the reality. Unfortunately, the attention of many ardent observers of natural phenomena was not directed to it, and hence I have had the good fortune to receive the aid of only two of my friends, whose observations have been incorporated in the description here given.

It was observed, soon after sunset, that an universal light appeared in the northern and north-western horizon, about 20° in altitude, which continued of an uniform colour and appearance, gradually becoming brighter. At eight o'clock it had the appearance of a fire in the northern part of the city; the colour of the light was precisely that of a fire just breaking out, when the flames are not seen. At ten the appearance of a fire still existed, and although the light earlier in the evening had been attributed to an aurora, yet so nearly did the light now resemble that produced by a fire, that I referred it to the burning of a pottery, the light from which is often observed in the same direction, for by this time it had extended completely round to the eastward. It was soon ascertained that the opinion was erroneous, and the existence of the 'northern lights' satisfactorily established. At nearly eleven o'clock the light rose upwards in large parallel waves or undulations. Vertical streaks darting upwards converged towards the zenith. A broad belt of beautiful rosy, pink light, commencing in the north-west gradually extended itself towards the north-east, at an elevation of about 60°—and remained for some time, visible in a direction from W. N. W. to E. S. E. The colour of this belt was most intense on its upper edge, and it gradually softened down through white into a delicate green. The sky was tinged with delicate prismatic colours, and the frequent vertical corruscations, which continually darted upwards gave animation to the picture. The upper edge above the rosy nebulus, was in a constant undulatory state, resembling the flapping of a flag or sail loosened in a breeze or shaken by the hand. The rolling of flames will perhaps convey a good idea of it, or the succession of billows upon the sea shore. In a direction a little to the westward, there was a brilliant streak of white light extending across the belt. The appearance of the whole changed about eleven o'clock, when the belt was not so distinct. It was now mostly of a pink colour, which increased in intensity to a reddish hue—ascending towards the zenith, it passed beyond it, and culminating in a point, became quite a deep red, towards which the whole seemed to tend.

Some of the streamers, after reaching their greatest height, passed down the opposite arch of the firmament, toward the southern horizon.

This I believe is one of the most brilliant displays of the 'northern light' ever noticed here, and none has ever been witnessed to extend so high, as I am informed in this latitude. I have not been able to obtain any observations made later than a little after eleven, although I heard casually that the aurora lasted all night. The moon was shining brightly during this display, but its clear silver light was distinctly different from the brilliant emanations of the aurora. Unfortunately no observations were made of the magnetic needle during the day preceding or through the continuance of the phenomenon. This is much to be regretted, as the observations during or preceding former occurrences of the aurora borealis, have indicated a considerable disturbance of the magnetic influence. The barometer during Friday rose from 30.08 in. to 30.15 in. and the weather was clear and pleasant—wind from N. W. Thermometer at 7 o'clock, P. M. 45°—at 10 P. M. 38°. Dew point 15°—at 10 A. M. much lower than on either the previous or succeeding day, and indicating a dry condition of the atmosphere.

These observations, though very inadequate to give a correct impression of the scene which they are designed to describe, may serve perhaps to revive in all their splendour, recollections of the beauty and magnificence of the 'northern lights of 1836.'

May 12.—Dr. Geddings reported upon several specimens referred to the section of zoology at former meetings. Professor Ducatel reported upon the specimens presented by Mr. Trevallyn, which had been referred to the section of mineralogy. Dr. A. H. Bayley, of Easton, presented a fine specimen of the *coluber eximius*, (corn snake :) Mr. Minifie the two fore feet of a kangaroo, from New Holland ; Rev. J. J. Chanche, six specimens of South American birds ; Dr. W. E. Coale, several specimens of *rana* and *coluber*. A memoir was read by Richard Wilmot Hall, M. D. 'on the use of water as fuel,' which was referred to the joint consideration of the sections of physics and chemistry. Dr. Aikin proffered on deposite a large collection of geological specimens from the Erie canal, which was accepted and the section of mineralogy charged with superintending their removal to the museum of the Academy. Mr. Fisher communicated the notice of a slight auroral display on the night of Sunday the 8th inst., and also information of the existence of a mineral spring in the western part of the city, containing *free carbonic acid*, *protocarbonate of iron*, *muriates of lime* and *magnesia*, and a trace of *vegetable matter*.

May 19.—Specimens were received from Dr. Cohen, Dr. Keener, and Mr. P. T. Tyson, and several works for the library from Mr. Fisher. Dr. J. W. Gretham, of Mount Vernon, Illinois, reported a table of meteorological observations, made at that place, for the month of April, 1836. Dr. Coale, from the section of mineralogy, reported that the geological specimens had been conveyed to the museum. The section was further charged with the duty of arranging these specimens. Mr. Green requested the attention of the Academy to a notice in the American Journal of Science, from the Albany Institute, containing a series of observations made on the 21st of December last, with the barometer, wet and dry bulb thermometer, &c. in compliance with the proposition published in the London Athenæum, that hourly observations should be made with those instruments by the men of science throughout the world, on four fixed days—21st of March, June, September, and December, for thirty-seven hours ; and commented upon the advantage likely to result to meteorological science if the proposed observations were generally undertaken and the results compared. Whereupon it was resolved, that a committee of three from the first section be appointed, to report at the next meeting upon the most expedient means of co-operating efficiently with such other societies and individuals as may join in the proposed observations.

May 26.—Specimens of fossils, shells, insects, &c. were received from Messrs. Alexander, Tyson, Minific, and Dr. Coale; a fine specimen of Derbyshire spar was received from Miss H. M. Davis, of Philadelphia; a handsome collection of dried lichens, from Newport, R. I. from Miss P. W. Lewis, of Philadelphia; an interesting historical relic, being part of the beam of a house erected in St. Domingo, A. D. 1492, by Columbus, was presented by D. Lewis, Esq. of Philadelphia. Several pamphlets were contributed for the library by Professor Ducatel. The committee appointed at the last meeting upon the subject of the meteorological observations proposed to be made in accordance with the general system proposed in Europe, submitted a report recommending that a committee be appointed to co-operate on behalf of the Academy—that the rooms of the Academy, and every facility for observation, should be placed at the disposal of the committee—that the expense of procuring and constructing the necessary instruments should be defrayed by subscriptions amongst the members—that the committee have authority to call upon the members for the use of any instruments which they may possess suitable for making the proposed observations—that any interesting natural phenomena which may occur shall be included in the table to be prepared by the committee—and finally, that a copy of the table shall be furnished for publication in the Journal of Science, and a copy to the Royal Society of London, to be disposed of as in their judgment will best promote the interests of science.

June 2.—Donations for the cabinet were received from Dr. Keener, Mr. Alexander, Dr. Baxley, Dr. Geddings, and Dr. Coale, and from Professor Ducatel and Matthew Carey, Esq. of Philadelphia, several works for the library. Twelve volumes of the transactions of the Royal Society of Lisbon, were also received as a donation from that Institution. Professor Ducatel deposited in the library six livraisons of Goldfuss' Petrifactions. Dr. Edmondson reported a table of meteorological observations for May, 1836, which was referred to the section of physics. The committee on meteorological observations made a report recommending the appointment of a committee of four, to have charge of the selection and construction of instruments—to prescribe the method of conducting the observations—and to invite the co-operation of other members, in the labour of observations. Lewis Brantz, James Green, J. H. Alexander, and Wm. R. Fisher, were appointed the committee. Professor Jameson, of Quito, Dr. Lewis R. Gibbes, of Charleston, and Rev. Virgil H. Barber, of Pennsylvania, were elected corresponding members; Commandeur Figaniere, chargé d'affaires from Portugal, was elected an honorary member. The librarian was directed to have Greenough's Geological Map of England, deposited by Professor Ducatel, mounted and varnished.

July 7.—A donation of valuable minerals was received from C. Tiernan, Esq. Several works were also presented to the library by Dr. Riddell, of Cincinnati, and Drs. Wright and Hall, of Troy. The committee on meteorological observations reported having procured the necessary instruments, and made the observation proposed on the 21st and 22d ultimo.

August 4.—Donations for the cabinet were received from Dr. A. Maddox, of Maryland, Mr. C. De Selding, J. S. Skinner, Esq. Mr. N. Potter, Mr. G. W. Andrews, and Dr. Coale. Mr. Alexander presented a copy of a treatise on the principal mathematical instruments employed in surveying, by F. W. Simms; American edition, with additions by J. H. Alexander. The committee on meteorological observations made a final report, which was directed to be printed and circulated.

September 1.—Donations for the cabinet were received from Dr. Geddings, J. S. Skinner, Esq. Dr. Cohen, Mr. Minifie, Mr. Green, Mr. Fisher, and Dr. Coale. Donations for the library were received from Dr. Riddell, of Cincinnati, M. Carey, Esq. of Philadelphia, and Wm. Maclure, Esq. Dr. Edmondson reported a table of meteorological observations for July, 1836, which was referred. M. Carey, Esq. of Philadelphia, was elected a corresponding member. The meteorological committee was directed to continue their duties on the 21st and 22d inst.

October 6.—Dr. Maddox, Dr. Geddings, Dr. Palmer, U. S. Navy, and Mr. Minifie, presented specimens for the cabinet. A treatise on the method of using chloride of soda, translated from the French of A. G. Labarraque, by Dr. Jacob Porter, was presented by the author. James C. Palmer, M. D. U. S. Navy, and Dr. L. D. Gale, of New York, were elected corresponding members. The committee on meteorological observations reported that the series of hourly observations had been made on the 21st and 22d of September, and that the table was being prepared for publication.

October 13.—The cabinet received donations from Mr. Minifie and Dr. Coale. Charles Cramer, Esq. of New York, presented a catalogue of plants growing in the vicinity of Troy; and the report of the Geological Society of Brussels. Dr. Edmondson reported a table of meteorological observations for August, 1836. Dr. J. W. Greetham reported a table of meteorological observations made at Mt. Vernon, Illinois, for June and July, 1836, both of which were referred to the section of physics. The chairman of the section of botany reported progress in the arrangement of plants referred to that section. Dr. Aikin, was appointed to lecture at the sitting of the 27th instant.

October 20.—Dr. Coale presented the skeleton of a wren. The section of physics reported upon the tables referred at the last sitting, embracing in the report suggestions of some modifications, which were approved by the academy. The section of mineralogy reported the receipt of a suit of geological specimens from Heidelburg, and that they had been placed in the cabinet.

October 27.—Donations for the cabinet, from Mr. Quinby, Dr. Coale, Dr. Zollickhoffer, and the Maryland Colonization Society. The remainder of the session was occupied by an interesting lecture from Mr. Quinby, on the mineralogy of the ancients, which was listened to with much attention, and a copy requested from the author for preservation in the library.

November 3.—Dr. Coale presented for the cabinet the skin of a monkey, tanned by the natives of Cape Palmas. Donations for the library from Professor Ducatel, Dr. Dunbar, Professor W. R. Johnson, of Philadelphia, and Com. Figaniere. Dr. Aikin delivered a lecture on the anatomy of plants. Dr. Henry P. Sartwell, of Pen Yan, N. Y. was elected a corresponding member. Mr. Fisher informed the academy that the arseniate of baryta, recommended by him at a former meeting, he had since ascertained should be employed only when the use of powdered arsenic was impossible—hence its use should be confined to the preservation of the plumage of birds. Mr. Fisher was appointed to read a paper at the following sitting, and Professor Ducatel at the succeeding one.

November 10.—Dr. Coale presented the prepared skeleton of a 'corvus crestata.' Mr. Fisher read a paper on the present state of pharmacy in the United States. J. J. Audubon was elected an honorary member of the academy.

November 17.—Donations for the cabinet were received from J. H. Naff, Dr. Riley, and Dr. Coale. Professor Ducatel read the introduction to an essay on the submersion of the Atlantis, being an attempt to show the reality of this event, and its probable connection with some geological phenomena. Professor Geddings gave a brief account of the insect which has proved so destructive to the elm tree. He described it as belonging to the genus *crioceros*, species *vittata;* and concluded with a description of the mode in which the eggs are deposited, and the insect subsequently developed

November 24.—Donations were received of several skulls and casts of skulls from Dr. Coale, and a specimen of the new British coin from Miss Minifie. A circular letter was received from the Albany Institute, requesting the academy to undertake a series of magnetic experiments, and acknowledging the receipt of the table of meteorological observations for June. The subject was referred to the meteorological committee.

December 1.—Donations were received for the cabinet from Mr. J. H. Quinby, Dr. Coale, Dr. Geddings; and a donation for the library from Mr. C. Z. Lucas. The chairman of the section of botany reported that the arrangment of plants referred to that section had been completed.

December 8.—Mrs. Richard Norris presented a collection of shells; and Professor Ducatel, and Mr. Quinby made additions to the cabinet. Matthew Carey, Esq. of Philadelphia, and Professor Ducatel, presented several works for the library. The section of botany made a final report upon the plants referred to it.

December 15.—Donations were this evening received from Dr. Coale, Mr. Wood, and Mr. Quinby.

December 22.—The Rev. Mr. Robertson, Mr. C. H. De Selding, Dr. Coale, Dr. Cohen, and Dr. Aikin presented many interesting specimens for the cabinet, embracing specimens of meteoric stones, sulphate of strontian, a collection of shells from Greece, &c. For the library, contributions were received from R. Harlan, M. D. of Philadelphia, and the Academy of Natural Sciences of Philadelphia. The meteorological committee reported having completed the quarterly, hourly, series of observations on the 21st and 22d of December.

December 29.—Donations for the cabinet were received from Drs. Geddings and Coale; and Mr. Tyson presented for the library the geological and topographical survey of the lands of the George's Creek Coal and Iron Company.

January 5.—The following officers were elected for the ensuing year:

JULIUS T. DUCATEL, *President.*
PHILIP T. TYSON, R. EGLESFIELD GRIFFITH, } *Vice-Presidents.*
WM. R. FISHER, *Secretary.*
DAVID KEENER, *Treasurer.*
J. H. QUINBY, *Librarian.*
JAMES GREEN, J. H. ALEXANDER, WM. EDWARD COALE, WM. RILEY, } *Curators.*

Donations were received for the cabinet and library, from Mr. C. H. De Selding, Dr. Coale, and Mr. C. Z. Lucas. Capt. Lewis Brantz communicated to the academy his annual summary of meteorological observations for the past year; showing the mean temperature, barometic pressure, general state of the weather, &c.

January 12.—Donations were received from Dr. Riley, Professor Ducatel, Mr. Quinby, Dr. Coale, and Mr. Tyson.

January 19.—Dr. Griffith, Dr. Geddings, Mr. Tyson, Col. Kearney, U. S. Army, and Professor Ducatel, contributed various specimens for the cabinet; and a large number of works for the library were presented by Professor Ducatel, Mr. J. D. Toy, New York Lyceum, Academy of Sciences of Philadelphia, Albany Institute, and Mr. Quinby. Professor Ducatel read an account of the prominent features of the geology of Maryland, embracing the coal formations in the western part of the state. A sufficient number of original essays and treatises having been collected, which are considered worthy of publication, and calculated to enhance the scientific reputation of the academy and community, it was resolved that a committee should be appointed to decide upon the measures necessary to be taken for publishing a volume of transactions.

January 26.—Donations of books were received from Mr. Minifie, Dr. Coale, and Dr. Cohen. The committee appointed at the last meeting, made a report recommending the publication of a volume of transactions, and prescribing the terms and regulations upon which the work should be conducted. Professor Ducatel read a description of the aurora borealis, which had appeared on the evening of the 25th inst. He also read a memoir of the early history of the academy.

February 2.—Dr. J. W. Greetham communicated to the academy a table of meteorological observations, made at Mount Vernon, Illinois, for October, November, and December, of the past year. Professor Ducatel read a biographical memoir of the first president of the academy, L. H. Girardin, LL. D. intended for publication in the volume of the transactions.

February 9.—Many interesting donations for the cabinet were received from Mr. P. T. Tyson, Dr. T. Buckler, Master James Buckler, Master William Buckler, Dr. Coale, Mr. I. Tyson, Jr. The Boston Natural History Society presented several numbers of the Boston Journal of Natural History. Mr. P. T. Tyson read a communication descriptive of the Frostburg coal formation, illustrated with a map and drawings.

February 16.—Donations from Mr. Joseph Neal, Dr. Annan, Master William Buckler, Dr. Coale, Mr. J. B. Fitzgerald, Mr. Quinby, and the Rev. Mr. Morris, were this evening added to the cabinet. The library also received several publications of interest from Professor Jacob Porter, of Plainfield, Mass., Professor W. R. Johnson, of Philadelphia, and Professor Ducatel. The latter gentleman read the first part of his description of physical geography of Maryland. Mr. James Cheston Linn exhibited specimens of water cement, prepared by himself from a native mineral found in Allegany county, Md.

February 23.—Donations were received for the cabinet and library, from Dr. Coale, Mr. Morris, Mr. Tyson, and Dr. Aikin. The section of zoology reported progress in the examination and arrangement of many specimens in natural history which had been referred to them.

Transcribed by order of the Academy from the minutes.

WM. R. FISHER, *Secretary.*

METEOROLOGICAL OBSERVATIONS FOR JANUARY, 1836.

DAYS.	THERMOMETER. S. R. MIN.	10 A. M.	3 P. M.	7 P. M.	BAROMETER. 10 A. M.	3 P. M.	7 P. M.	WIND. DIRECTION.	FORCE.	DEW POINT. 10 A.M.	WATER IN INCHES.	STATE OF THE WEATHER.
1	19	32	39	33	30.01	29.93	29.97	SW.W.W.	light.	18		clear fine day.
2	24	33	51	41	30.07	30.06	30.07	W.W.SW.	lt. mod.	21		clear—lt. clds. fr. NW.
3	33	39	38	35	30.27	30.26	30.28	E.E.E.	light.	34		clouds fr. E. rain.
4	33	36	42	42	30.15	29.97	29.91	N.NW.SW.	light.	34		cloudy—rain.
5	36	44	44	43	29.96	29.94	30.02	W.NE. .	light.	42		clds. fr. N. and E. driz.
6	36	37	35	33	30.22	30.23	30.24	E.E.NE.	moderate.	33		clds. fr. E. driz.
7	28	30	36	36	30.09	29.86	29.81	NE.NE.NE.	str. v. str.	25		clds. fr. NW. NE. rain.
8	30	37	36	34	29.60	29.60	29.65	NNE.NNW.NW.	strong.	33		clds. fr. NE. N. rn. SW.
9	33	40	38	35	29.57	29.52	29.52	N.NNW.NNW.	very str.	26		clds. fr. SW. NW. snow.
10	31	37	39	38	29.46	29.50	29.56	NW.N.NW.	very str.	26	2.43	clds. fr. NNW. snow.
11	34	38	39	35	29.69	29.69	29.73	NW.NW.NW.	strong.	24		lt. clds. fr. NW. fine dy.
12	30	40	50	45	29.85	29.82	29.87	NW.W.W.	light.	27		clear—lt. clds. fr. W.
13	39	46	47	42	29.98	29.92	29.96	E.SE.SE.	light.	35	0.05	clds. fr. E. W. S. rain.
14	27	36	48	41	30.06	30.01	30.05	SW.W.W.	light.	27		clear fine day.
15	25	32	34	29	30.15	30.07	30.09	NW.W.W.	moderate.	12		lt. clds. fr. W. clear.
16	18	25	28	22	30.23	30.14	30.15	E.N.N.	moderate.	3		clear fine day.
17	17	22	29	27	29.86	29.67	29.65	NW.NW.NW.	moderate.	19	0.17	snow—clds. fr. NW.
18	22	33	42	36	29.55	29.62	29.75	NW.NW.NW.	moderate.	21		clear—clds. fr. W. clr.
19	19	34	37	26	30.00	29.94	29.99	W.W.NW.	light.	7		clear fine day.
20	15	28	32	23	30.18	30.17	30.23	NW.NW.NW.	moderate.	8		clear fine day.
21	15	33	40	36	30.16	30.00	29.94	SW.S.SW.	light.	20	0.19	clear—clds. fr. SW. rn.
22	32	38	43	39	29.73	29.78	29.87	W.W.W.	mod. str.	36		clds. fr. W. damp.
23	22	26	28	23	30.18	30.21	30.30	NW.NW.NW.	strong.	2		clear fine day.
24	14	25	25	32	30.42	30.24	30.02	NE.NNE.NE.	light.	8	0.85	clds. fr. NE. snow, rn.
25	27	32	30	26	29.63	29.78	29.93	NW.NW.NW.	moderate.	5		clear fine day.
26	19	28	27	20	29.96	29.96	30.03	W.NW.NW.	moderate.	4		clds. fr. W. clear.
27	7	19	21	14	30.03	29.94	30.04	NW.NW.NW.	str. mod.	—4		clear—lt. clds. fr. W. cl.
28	7	14	16	11	30.09	30.02	30.06	NW.NW.NW.	moderate.	—7		clear fine day.
29	2	16	27	24	30.08	29.96	29.97	NW.SW.SW.	lt. mod.	—6		clear fine day.
30	17	28	38	33	29.90	29.79	29.78	S.SSE.E.	light.	5		lt. clds. fr. SW. cr. hz.
31	34	38	34	28	29.53	29.42	29.49	W.NW NW.	moderate.	35	0.25	cldy. snow, clear.
Mean,	24	32	36	31.68	29.95	29.90	29.96	Prevailing, NW.		18.48	3.94	

METEOROLOGICAL OBSERVATIONS FOR FEBRUARY, 1836.

DAYS.	THERMOMETER. S. R. MIN.	10 A. M.	3 P. M.	7 P. M.	BAROMETER. 10 A. M.	3 P. M.	7 P. M.	WIND. DIRECTION.	FORCE.	DEW POINT. 10 A.M	WATER IN INCHES.	STATE OF THE WEATHER.
1	12	15	14	8	29.73	29.75	28.86	NW.NW.NW.	str. v. str.	—10		clear fine day.
2	0	12	13	8	20.93	29.86	29.95	W.NW.NW.	moderate.	— 9		clear fine day.
3	— 5	14	17	12	30.01	29.92	29.93	W.NW.NW.	moderate.	— 8		clear fine day.
4	2	13	11	6	30.05	30.08	30.15	NW.NW.NW.	str. mod.	— 4		clear fine day.
5	— 4	12	16	8	30.18	30.12	30.15	NW.W.NW.	moderate.	—11		clear fine day.
6	— 3	17	23	20	30.26	30.20	30.22	W.NW.SW.	lt. mod.	— 5		clear, cldy, fr. w.
7	21	32	32	33	30.13	30.06	29.98	E.SE.SE.	light.	20	0.37	cldy, snow and rain.
8	27	33	37	31	29.71	29.65	29.69	NW.NW.NW.	lt. mod.	18		clear fine day.
9	14	30	50	42	29.74	29.69	29.72	SW.SW.SW.	light.	16		clear—lt. cldy. fr. w.
10	22	38	42	28	30.02	30.03	30.13	W.NW.SE.	light.	15		clear fine day.
11	17	33	33	32	30.41	30.38	30.38	NW.SE.SE.	moderate.	10		cl. cldy. fr. sw. w. nt.
12	27	32	32	31	30.26	30.19	30.17	E.NE.NE.	moderate.	26		cldy. fr. E. rn. & driz.
13	30	37	40	38	29.88	29.80	29.81	SW.NE.NE.	light.	29	0.23	cldy. fr. w. rn. & s. nt.
14	26	27	25	19	29.89	29.87	29.96	NW.NW.NW.	very st.	5		clear fine day.
15	12	30	38	34	29.70	29.48	29.49	SW.SW.SW.	mod. lt.	10		cldy fr. w. fog. nt.
16	25	28	29	25	29.92	29.93	29.96	N.W.N.	light.	8		cldy. fr. w. fine day.
17	22	27	29	22	29.86	29.90	30.00	SE.NW.NW.	mod. st.	22	"	cldy. fr. SE. w. snow.
18	6	17	25	16	30.33	30.28	30.28	NW.E.N.	moderate.	— 8		clear fine day.
19	12	22	27	24	30.21	30.17	30.16	NE.N.N.	light.	0	"	cldy. fr. NE. E. snow.
20	22	34	40	32	30.02	29.95	29.93	E.NW.SE.	light.	28	0.21	cldy. fr. E. NW. snow.
21	28	41	45	37	29.94	29.90	29.96	NW.NW.W.	lt. mod.	27		clear, fine, thaw.
22	26	40	53	40	30.00	29.92	29.94	SW.W.W.	light.	20		clear fine day.
23	31	43	50	42	29.91	29.85	29.83	E.SE.S.	light.	30	"	cldy. fr. sw. w. rn. nt.
24	37	42	51	43	29.62	29.46	29.43	NW.E.SW.	light.	39	0.52	cldy. fr. w. rn. lig. nt.
25	27	33	38	34	29.87	29.92	29.99	W.NW.NW.	strong.	5		clear, fine. ov. nt.
26	24	24	24	24	29.73	29.61	29.72	NE.N.W.	moderate.	16	1.53	cldy. fr. E. NE. sn. st.
27	14	28	35	26	30.18	30.15	30.23	SW.W.SW.	light.	— 5		clear fine halo nt.
28	15	28	32	24	30.50	30.46	30.47	N.NW.N.	light.	—10		cldy fr. NW. w.
29	19	27	31	27	30.23	31.03	29.94	NE.N.N	moderate.	4	.55	clds. fr. NE. sn. rn.
Mean	17.45	28.24	32.13	26.41	30.01	29.95	29.97	Prevailing Wind, N.W.		9.58	3.41	

METEOROLOGICAL OBSERVATIONS FOR MARCH, 1836.

DAYS.	THERMOMETER.				BAROMETER.			WIND.		DEW POINT.	WATER IN INCHES.	STATE OF THE WEATHER.
	S. R. MIN.	10 A. M.	3 P. M.	7 P. M.	10 A. M.	3 P. M.	7 P. M.	DIRECTION.	FORCE.	10 A.M.		
1	25	34	37	40	29.58	29.40	29.35	S.SE.SW.	light.	28	0.33	cldy. fr. s. rain.
2	21	25	25	21	30.03	30.13	30.17	NW.NW.SW.	strong.	0		clear.
3	10	35	45	35	30.21	30.12	30.14	SW.SW.SW.	light.	1		clear mild day.
4	17	39	51	41	30.01	29.87	29.77	SW.SE.S.	light.	4		clear, mild.
5	22	47	44	37	29.57	29.67	29.80	SW.NW.NE.	moderate.	20		cldy. fr. sw. sn. nt.
6	27	41	43	36	29.88	29.80	29.77	NE.SW.SE.	light.	20	0.03	cldy. fr. w. clear.
7	29	40	45	37	29.78	29.70	29.66	NW.SSW.SE.	light.	15		clear fine day.
8	28	38	40	31	29.73	29.72	29.76	NW.NW.NW.	moderate.	4		clear fine day.
9	18	38	43	40	29.98	29.87	29.88	SE.SE.SE.	moderate.	15		clear fine day.
10	29	37	41	33	29.67	29.39	29.25	NE.E.SE.	moderate.	34	0.73	clds. from E. rain nt.
11	31	38	37	29	29.70	29.73	29.90	NW.NW.NW.	very str.	15		clear fine day.
12	16	25	28	25	30.24	30.23	30.29	NW.NW.NW.	v. s. mod.	—4		clear fine day.
13	16	33	40	39	30.32	30.15	30.04	SE.SE.SE.	strong.	7	0.06	clr. cldy. fr. NE. hl. nt.
14	35	47	57	43	29.90	29.91	30.03	SW.NW.NW.	moderate.	35		lt. cldy. fr. sw. clr.
15	29	33	37	31	30.30	30.30	30.36	NNW.NW.NNE.	strong.	0		clear fine day.
16	22	35	36	30	30.44	30.32	30.27	SE.SW.SE.	moderate.	2	"	overcast, sn. rn. nt.
17	28	39	50	49	29.89	29.74	29.71	SW.W.W.	light.	34	0.10	cldy. fr. sw. rn.
18	46	47	46	38	29.93	30.00	30.14	NW.NW.NW.	strong.	15		clear fine day.
19	25	38	35	31	30.27	30.12	30.08	SE.SE.E.	light.	7	0.01	cldy. fr. w. lt. sn. nt.
20	27	42	47	34	29.98	29.92	29.96	NW.NW.W.	light.	10		clr. cldy. fr. w. clr.
21	26	40	41	37	29.95	29.82	29.76	E.SE.SE.	light.	23	0.01	cldy. fr. w. lt. snow.
22	31	37	37	32	29.72	29.69	29.77	NW.NW.NW.	str. v. str.	12		clr. cldy. fr. NW. clear.
23	24	34	40	36	30.08	30.06	30 05	NW.W.W.	strong.	2		cldy. fr. w. clear.
24	21	44	60	44	30.04	29.93	30.02	SW.SW.NW.	moderate.	23		clr. cldy. fr. NW.
25	29	37	39	34	30.28	30.28	30.34	NW.NW.NW.	strong.	8		clear fine day.
26	22	37	42	36	30.50	30.41	30.38	NW S.SSE.	moderate.	4		clear fine day.
27	26	45	57	46	30.20	30.02	30.01	SW.SE.SSE.	light.	15		clear fine day.
28	32	52	56	50	29.96	29.92	29.97	SW.E.E.	light.	34	0.05	cldy. rain.
29	45	53	51	44	30.13	30.14	30.19	E.E.E.	moderate.	37	"	cldy. fr. w. NE. rn.
30	35	37	40	38	30.24	30.23	30.28	E.NE.NE.	moderate.	32	0.32	cldy. fr. E. rn.
31	34	47	50	47	30.35	30.26	30.22	SW.SE.SE.	mod. lt.	24		clr. lt. cldy. fr. NW.
Mean	26.64	39.16	43.22	36.90	30.03	29.96	29.97	Prevailing, NW. and SE.		15.35	1.64	

METEOROLOGICAL OBSERVATIONS FOR APRIL, 1836.

DAYS.	THERMOMETER.				BAROMETER.			WIND.		DEW POINT.	WATER IN INCHES.	STATE OF THE WEATHER.
	S. R. MIN.	10 A. M.	3 P. M.	7 P. M.	10 A. M.	3 P. M.	7 P. M.	DIRECTION.	FORCE.	10 A.M.		
1	39	42	45	43	30.07	29.98	29.96	E.SE.SE.	light.	33	0.05	clds. fr. E. rn. mor.
2	40	55	54	51	29.91	29.83	29.81	W.S.S.	moderate.	35		lt. clds. fr. w. fine.
3	42	62	62	58	29.83	29.75	29.75	E.SE.SSE.	light.	44		clear.
4	42	43	44	45	29.69	29.69	29.71	E.E.E.	moderate.	37	0.54	cldy. fr. E. rain.
5	34	49	56	48	29.91	29.84	29.87	NW.SSE.E.	moderate.	18		clear.
6	30	38	42	38	30.07	30.05	30.09	NW.NW.NW.	str. mod.	2		snow, morn. clear.
7	23	44	47	43	30.23	30.14	30.14	SW.E.SE.	moderate.	15	0.10	clear.
8	28	50	55	54	30.12	30.07	29.98	SW.S.S.	moderate.	31		clear. lt. cldy. fr. w.
9	54	67	77	68	29.82	29.72	29.69	S.S.S.	moderate.	54	"	clear, rain, nt.
10	51	52	50	41	29.68	29.81	29.95	NW.NW.NW.	strong.	35	0.31	cldy. fr. w. rn. clear.
11	28	40	49	40	30.11	30.05	30.11	NW.W.NW.	moderate.	14		clear.
12	28	41	49	43	30.35	30.28	30.24	E.SE.SE.	moderate.	12		clear.
13	34	37	50	49	30.00	29.66	29.56	E.SE.S.	moderate.	34	2.00	cldy. fr. s. E. rn.
14	40	56	66	56	29.65	29.53	29.62	SW.SE.N.	moderate.	42		clear.
15	35	52	52	48	29.82	29.83	29.94	NW.NW.NW.	moderate.	29		cloudy fr. NNW. cl.
16	33	53	54	50	30.14	30.09	30.10	E.SE.SE.	moderate.	25		clear.
17	39	41	46	46	30.16	30.11	30.08	E.E.E.	light.	35	"	cldy. fr. E. rain.
18	47	55	56	57	29.87	29.76	29.78	E.W.S.	light.	52	"	cldy. fr. E. rn. clr.
19	48	50	51	50	30.06	30.07	30.12	N.N.N.	moderate.	47	"	cldy. fr. sw. new rn.
20	46	60	65	59	30.25	30.20	30.21	E.E.E.	moderate.	45	"	cldy. fr. E. SE. rain.
21	46	55	62	56	29.94	29.71	29.60	E.S.SW.	moderate.	48	1.23	cldy. fr. E. sww. rn.
22	39	46	54	45	30.08	30.10	30.15	NW.NW.NW.	strong.	15		clear aurora.
23	36	54	60	55	30.14	29.94	29.96	S.SSE.SE.	moderate.	25		cldy. fr. w. clear.
24	44	57	60	55	30.23	30.23	30.25	NW.W.S.	light.	26		clear.
25	37	50	65	54	30.47	30.32	30.25	E.E.S.	moderate.	24		clear.
26	44	68	80	76	29.99	29.87	29.86	W.SW.SW.	moderate.	55		clear.
27	64	74	78	70	30.02	30.02	30.06	W.W.NE.	moderate.	39		clear.
28	46	66	70	62	30.24	30.15	30.14	SE.SE.NE.	moderate.	34		lt. cldy. fr. w. SE.
29	55	70	72	70	30.08	29.98	29.96	E.E.SW.	light.	56		cldy. fr. w. clear.
30	57	71	67	58	30.18	30.22	30.29	E.E.E.	mod. st.	54		clr. lt. cldy. fr. NW.
Mean	41	53	59	53	30.04	29.97	29.98	Prevailing, E. SE. and N.W.		34	4.23	

METEOROLOGICAL OBSERVATIONS FOR MAY, 1836.

DAYS.	THERMOMETER.				BAROMETER.			WIND.		DEW POINT.	WATER IN INCHES.	STATE OF THE WEATHER.
	S. R. MIN.	10 A. M.	3 P. M.	7 P. M.	10 A. M.	3 P. M.	7 P. M.	DIRECTION.	FORCE.	10 A.M.	INCHES.	
1	43	65	68	64	30.30	30.17	30.11	E.E.SW.	light.	40		clds. fr. NW. clear.
2	49	75	82	72	29.94	29.80	29.75	SE.SE.SE.	moderate.	56		clear.
3	62	81	85	72	29.73	29.65	29.67	SW.SW.SW.	light.	58	0.08	clear, rain nt.
4	65	80	76	68	29.81	29.83	29.88	W.NW.NE.	moderate.	56		clear.
5	44	66	70	64	30.03	29.97	29.98	E.SE.SE.	moderate.	32		clear.
6	43	68	70	65	30.01	29.94	29.92	SE.SE.E.	mod. str.	37		clear, cldy. fr. w. rn.
7	56	63	67	62	29.73	29.65	29.70	E.E.NW.	light.	59	0.15	cldy. fr. w. rn.
8	56	64	70	58	29.90	29.89	29.90	NW.NW.NW.	moderate.	35		cldy. fr. w. clear.
9	43	62	67	58	30.12	30.10	30.13	NNW.NE.S.	light.	22		clear.
10	38	66	68	62	30.19	30.11	30.09	S.E.SW.	moderate.	34		clear.
11	42	68	74	66	29.99	29.89	29.87	E.SE.SW.	light.	42		clouds fr. E. rain.
12	55	74	76	70	29.73	29.61	29.59	SW.SE.SE.	light.	60	0.08	clds. fr. w. rn. met.
13	59	74	71	60	29.67	29.78	29.97	NW.NW.NW.	strong.	43		clear.
14	38	59	59	56	30.30	30.22	30.21	E.E.SE.	strong.	23		clear.
15	39	60	65	59	30.25	30.13	30.11	SE.SE.SSE.	mod. str.	29		clear.
16	50	77	82	67	30.02	29.91	29.92	SW.S.S.	light.	63	0.18	clear, rn. thunder.
17	58	81	83	76	29.92	29.88	29.91	SW.SW.SW.	moderate.	64		clear, lt. cldy. fr. w.
18	59	84	84	74	29.96	29.88	29.92	S.SW.SW.	moderate.	62	0.04	clr. cldy. fr. w. rn. nt.
19	57	75	77	70	30.14	30.09	30.10	SE.SE.SSE.	strong.	26		clear.
20	48	76	76	70	30.14	30.04	29.97	S.SE.SE.	strong.	57		clear. lt. cldy. fr. w.
21	61	84	85	78	29.90	29.83	29.81	SW.SW.SW.	light.	61		clear.
22	62	85	90	82	29.80	29.68	29.70	S.SSE.SW.	light.	71		clear, cldy. fr. w.
23	64	80	84	80	29.74	29.69	29.70	W.SE.SE.	moderate.	61		clear.
24	61	80	79	70	29.67	29.58	29.59	SE.SE.SE.	strong.	67	0.35	cldy. fr. SSE. rn. nt.
25	63	73	73	67	29.70	29.72	29.79	W.N.N.	moderate.	62		cloudy fr. w.
26	59	60	56	53	29.93	29.91	29.98	NE.E.E.	str. mod.	55		cldy. fr. E. rain.
27	48	51	54	52	29.99	29.95	29.94	E.NE.NE.	mod. lt.	49		cldy. fr. NE. rain..
28	50	62	67	64	29.88	29.80	29.82	N.E.SE.	light.	49		cldy. fr. w. rn. nt.
29	61	64	63	59	29.84	29.78	29.83	SE.NNE.E.	moderate.	62		cldy. fr. E. rain.
30	50	52	51	48	29.92	29.91	29.94	E.NNE.E.	strong.	49		cldy. fr. E. rain.
31	45	48	45	44	29.90	29.88	29.87	E.NNE.NE.	strong.	45	3.43	cldy. fr. E. rain.
Mean,	52.51	69.58	71.52	64.84	29.940	29.880	29.893	Prevailing, SE. and E.		49.45	4.31	

METEOROLOGICAL OBSERVATIONS FOR JUNE, 1836.

DAYS.	THERMOMETER.				BAROMETER.			WIND.		DEW POINT.	WATER IN INCHES.	STATE OF THE WEATHER.
	S. R. MIN.	10 A. M.	3 P. M.	7 P. M.	10 A. M.	3 P. M.	7 P. M.	DIRECTION.	FORCE.	10 A.M.		
1	43	52	56	56	29.79	29.75	29.71	E.NE.NE.	strong.	48		clds. fr. E. rain.
2	52	61	60	60	29.76	29.74	29.76	E.E.E.	strong.	57		clds. fr. E. rain.
3	58	62	63	60	29.81	29.80	29.80	E.NE.E.	moderate.	59		clds. fr. E. rain.
4	58	63	66	63	29.80	29.82	29.84	E.E.E.	light.	59	2.10	clds. fr. E. rain.
5	59	63	69	65	29.93	29.91	29.92	E.E.E.	moderate.	60		clds. fr. E. rain.
6	57	63	63	63	29.93	29.90	29.94	NE.NE.SE.	moderate.	59		clds. fr. E. rain.
7	61	68	73	67	29.95	29.90	29.90	SE.SE.NW.	light.	65		clds. fr. E. damp.
8	65	75	75	73	29.98	29.96	29.99	N.SE.SW.	moderate.	70	1,35	clds. fr. E. rain.
9	60	80	82	77	30.03	29.98	30.00	E.SW.SW.	moderate.	68		clear.
10	62	81	83	78	30.05	30.00	30.00	NW.SE.SE.	light.	72		clear.
11	67	79	82	68	29.88	29.77	29.80	SE.S.S.	moderate.	69	0.29	clear, clds. fr. W. rain.
12	63	74	77	72	29.97	29.95	29.97	NW.SE.SW.	light.	63		clds. fr. W. clear.
13	59	65	69	67	30.08	30.05	30.05	NE.NE.NE.	strong.	57	0,04	clds. fr. E. rain.
14	59	70	74	70	30.02	29.95	29.95	E.SE.SE.	light.	53		clear.
15	59	75	78	73	30.05	30.02	30.06	NW.NW.NW.	strong.	43		clear.
16	58	77	80	76	30.06	30.00	29.96	E.E.SW.	strong.	60		clear.
17	67	86	89	83	29.75	29.90	29.88	W.SSE.SW.	strong.	65		clear.
18	72	89	90	85	29.93	29.83	29.83	W.SW.SW.	strong.	63		clear.
19	73	88	90	70	29.81	29.67	29.70	SW.SW.NW.	strong.	68	0.46	clear, gust fr. SW.
20	71	82	87	73	29.66	29.58	29.63	SW.SW.E.	strong.	70	1.59	clear, gust fr. SW.
21	60	66	73	63	29.75	29.76	29.80	E.E.NE.	moderate.	61		clds. fr. SW. W. rain.
22	59	63	71	67	29.91	29.88	29.88	NE.S.SE.	strong.	59		clds. fr. E. rain.
23	58	62	62	57	29.91	29.87	29.90	SE.SE E.	strong.	57		clds. fr. E. rain.
24	54	58	60	59	29.97	29.96	29.97	E.E.E.	strong.	50	1.35	clds. fr. E. rain.
25	53	60	64	61	29.99	29.97	29.94	E.E.E.	light.	52		clds. fr. E. rain nt.
26	57	57	59	58	29.92	29.85	29.85	E.ENE.NE.	moderate.	54	2.00	clds. fr. E. rain.
27	59	63	69	64	29.87	29.88	28.88	N.E.NE.	moderate.	58		lt. clds. fr. NE.
28	57	69	75	69	29.89	29.84	29.83	W.NW.SW.	light.	58		clds. fr. W. clear.
29	61	76	76	74	29.86	29.85	29.88	SE.SE.SE.	light.	63		clear.
30	60	76	78	76	29.96	29.92	29.93	SW.SW.W.	light.	63		clear.
Mean,	60	70	73	68	29.90	29.87	29.88	Prevailing, E.SE.SW.		60	9.18	

METEOROLOGICAL OBSERVATIONS FOR JULY, 1836.

DAYS.	THERMOMETER.				BAROMETER.			WIND.		DEW POINT.	WATER IN	STATE OF THE WEATHER.
	S. R. MIN.	10 A. M.	3 P. M.	7 P. M.	10 A. M.	3 P. M.	7 P M.	DIRECTION.	FORCE.	10 A.M.	INCHES.	
1	65	80	84	77	29.95	29.89	29.90	S.S.SE.	light.	67		clear.
2	68	80	78	70	29.93	29.91	29.90	SE.S.NNW.	light.	67	0.24	cldy. fr. W. rn.
3	66	77	82	76	29.93	29.90	29.87	SE.SE.SE.	light.	68		clear.
4	73	77	84	76	29.90	29.86	29.86	W.S.SW.	light.	70	0.40	cldy. fr. W. rain.
5	69	79	82	79	29.95	29.87	29.90	SW.SW.SW.	light.	70	0.13	clear, cldy. fr. NW. rn.
6	70	77	80	78	29.98	29.95	29.97	SW.SW.SW.	light.	71		cldy. fr. W. clear.
7	69	83	85	82	30.02	29.96	29.97	W.SW.SW.	light.	70		clear.
8	69	84	79	82	29.96	29.87	29.84	E.SE.SW.	light.	68	0.30	clear, rain, clear.
9	72	83	89	84	29.83	29.75	29.75	W.W.SW.	light.	68	0.01	clr. cldy. fr. W. rn. clr.
10	76	78	82	77	29.87	29.87	29.88	NW.NW.NW.	moderate.	67		clear, cldy. fr. W.
11	68	78	84	77	29.95	29.91	29.93	NE.NE.NE.	light.	65		cldy. fr. NE. clear.
12	70	81	82	79	29.92	29.87	29.84	NW.NE.E.	light.	69		cldy. fr. NE. clear.
13	69	79	83	77	29.83	29.78	29.78	NE.E.NE.	moderate.	67		cldy. fr. NE. clr. N. clr.
14	72	82	85	76	29.80	29.77	29.80	SE.SW.NE.	moderate.	71		cld. fr. E. clr. cld. fr. E.
15	67	71	73	72	29.90	29.92	29.94	N.NNE.N.	moderate.	65	0.21	cldy. fr. N. rain.
16	65	70	78	71	30.00	29.99	30.00	E.E.NE.	moderate.	61		clear.
17	57	69	72	68	30.13	30.12	30.15	NE.NE.NE.	strong.	43		clear.
18	56	78	81	74	30.25	30.21	30.20	N.NW.S.	light.	52		clear.
19	63	81	84	76	30.17	30.10	30.08	SW.SW.SW.	moderate.	53		clear.
20	64	82	85	78	29.95	29.87	29.83	SW.SW.SW.	light.	60		clear.
21	67	71	85	79	29.71	29.58	29.53	SW.SW.SW.	light.	62	0.09	cldy. fr. W. rain.
22	68	75	81	77	29.60	29.61	29.67	NE.N.E.	light.	66		cldy. fr. NW. clear.
23	69	79	81	78	29.85	29.84	29.85	E.SE.SE.	light.	56		clear.
24	70	77	86	81	29.88	29.85	29.84	S.SW.SW.	light.	69		cloudy fr. W.
25	78	81	83	80	29.89	29.86	29.87	E.E.E.	light.	69		cldy. fr. E. rain.
26	69	69	70	71	29.85	29.89	29.92	NE.N.N.	light.	67	0.19	cldy. fr. NE. rain, clear.
27	60	70	77	72	30.03	29.98	29.87	NNW.W SW.	light.	51		cldy. fr. W. clear.
28	66	77	78	74	29.94	29.91	29.92	SW.SE SE.	light.	59	0.06	clds. fr. SW. rn. clear.
29	69	77	77	77	29.80	29.74	29.69	SW.S.S.	light.	64	0.02	cldy. fr. SW. rn.
30	73	79	86	78	29.68	29.69	29.74	W.W.NW.	light.	69	0.03	cldy. fr. W. rn. clear.
31	65	85	88	82	29.92	29.90	29.93	SE.SE.SE.	moderate.	61		clear.
Mean,	67.80	77.74	81.46	76.71	29.90	29.88	29.88	Prevailing, SW. and NE.		64	1.68	

METEOROLOGICAL OBSERVATIONS FOR AUGUST, 1836.

DAYS.	THERMOMETER. S. R. MIN.	10 A. M	3 P. M.	7 P. M.	BAROMETER. 10 A. M.	3 P. M.	7 P. M.	WIND. DIRECTION.	FORCE.	DEW POINT. 10 A.M.	WATER IN INCHES.	STATE OF THE WEATHER.
1	70	85	87	81	29.95	29.88	29.91	SW.SW.SE.	lt. mod. lt.	70		cld. fr. w. clr. cldy. w.
2	69	78	81	76	30.10	30.05	30.06	E.SE.SE.	moderate.	57		clear.
3	71	78	82	79	29.98	29.89	29.88	SW S.S.	lt. lt. mod.	64.10	0.10	cldy. fr. w. rn. clr. clr.
4	70	78	82	75	29.98	29.98	30.00	NW.NW.NE.	st. st. lt.	55		clear.
5	65	75	74	72	30.15	30.13	30.13	E.N.NE.	mod. lt. lt.	56		cldy. fr. w. rn. rn.
6	59	63	66	64	30.09	30.06	30.08	E.E.NE.	light.	60	0.55	cldy. fr. NE. rain.
7	63	71	77	70	30.13	30.07	30.08	W.W.W.	light.	63		cldy. fr. E. cldy.
8	64	80	85	77	30.05	29.94	29.92	SW.SW.SW.	light.	70		cldy. fr. NW.
9	70	77	69	66	29.91	29.95	29.93	NE.NE E.	st. mod. mod.	63	0.01	cldy. fr. NE. rain.
10	57	67	68	64	30.04	29.99	29.95	E.E.SE.	mod. st. mod.	45	0.04	cldy. fr. E. E. S. rn.
11	63	67	76	70	29.93	29.85	29.87	SW.SW.W.	light.	60	0.01	cldy. fr. sw. w. w.
12	60	70	74	68	29.99	29.97	29.97	NW.NW.NW.	st. mod. lt.	50		clear.
13	60	76	80	71	29.93	29.91	29.82	SW.SW.S.	lt. mod. lt.	54		cldy. fr. NW. clr. clr.
14	63	82	85	79	29.76	29.74	29.78	W.SW.SW.	moderate.	66	0.06	clear.
15	69	76	72	70	29.90	29.83	29.90	E.NNE.NW.	mod. st. lt.	59		cldy. fr. w. do. N.
16	60	80	81	73	29.97	29.94	29.95	W.SW.NNW.	lt. st. lt.	56		clr. clr. cldy. fr. N.
17	61	76	78	75	30.01	29.99	29.99	E.NE.NE.	st. mod. lt.	59		cldy. fr. NE. clr. clr.
18	67	79	76	72	29.90	29.80	29.75	E.SSE.S.	strong.	63	0.12	cldy. fr. w. do. sw. rn.
19	69	83	87	78	29.72	29 70	29.72	W.SW.NW.	mod. lt. lt.	67		cldy. fr. sw. clr. clr.
20	69	77	74	67	29.94	29.95	30.00	NW.NW.NW.	st. st. lt.	52		clear.
21	52	76	79	77	30.00	29.96	29.90	SW.SW.SW.	light.	54		clear.
22	61	76	77	69	29.98	29.96	30.00	NW.	lt. mod. mod.	58		clear.
23	60	65	67	59	30.06	30.03	30.04	NE.	lt. mod. lt.	47	}	cld. fr. w. rn. E. rn. do.
24	56	60	65	63	30.13	30.11	30.10	E.NE.NE.	light.	54	} 2.00	cldy. fr, E. rain.
25	62	71	76	70	30.16	30.08	30.06	SE.S.S.	light.	60	}	cldy. fr. sw. w. w.
26	67	69	67	65	29.98	29.88	29.86	W.E.NE.	lt. mod. st.	65	}	cldy. fr. w. rn. E. NE.
27	64	72	76	70	29.88	29.86	29.87	NE.S.SW.	mod. mod. lt.	63		cldy. fr. E. clr.
28	62	80	83	76	29.97	29.94	29.95	SW.S.S.	lt. mod. lt.	57		clear.
29	65	76	78	71	29.89	29.81	29.77	SW.	light.	67	0.26	cldy. fr. w. do. rain.
30	60	70	70	64	29.84	29.86	29.93	NW.	st. mod. mod.	51		clear.
31	48	68	71	65	30.03	29.95	29.93	NW.SW.	light.	41		clear.
Mean,	63.09	74	76.26	70.84	29.97	29.94	29.95	Prevailing, sw. and NW.		58.25	3.15	

METEOROLOGICAL OBSERVATIONS FOR SEPTEMBER, 1836.

DAYS.	THERMOMETER. S. R. MIN.	10 A. M.	3 P. M.	7 P. M.	BAROMETER. 10 A. M.	3 P. M.	7 P. M.	WIND. DIRECTION.	FORCE.	DEW POINT. 10 A.M	WATER IN INCHES.	STATE OF THE WEATHER.
1	57	76	79	70	29.80	29.79	29.78	W.SW.SW.	lt. mod. mod.	58	0.33	clr. clds. fr. w. do. rn.
2	53	67	70	65	30.07	30.03	30.03	SE.	lt. mod. mod.	48		clr. clr. clds. fr. w.
3	61	76	78	72	30.02	29.96	29.97	SW.	light.	61		clds. fr. w. clr. fr. w.
4	64	76	80	76	29.99	29.96	29.88	SW.	light.	66		clds fr. w.
5	69	72	76	67	29.82	29.81	29.89	SW.NE.NE.	lt. lt. mod.	69	—.16	clds. fr, w. rain.
6	54	60	65	59	30.13	30.11	30.16	NW.E.NE.	st. mod. st.	40		clr. clr. clds. fr. w.
7	50	63	66	60	30.19	30.16	30.16	E.	st. mod. mod.	45		lt. clds. fr. E. clear.
8	51	63	70	66	30.10	30.07	30.00	S.E.E.	light.	50		clear.
9	54	76	76	70	30.00	29.93	29.99	S.SE.SE.	lt. mod. lt.	63		clr clds. fr. w. clr.
10	61	71	75	70	30.07	30.03	30.05	SE.	strong.	64		clds. fr. E. SE. SE.
11	64	68	76	70	30.07	30.06	30 05	E.	lt. mod. lt.	65	0.06	clds. fr. E. rain.
12	69	80	84	78	30.07	30.04	30.06	S.S.S.	light.	74		clds. fr. w. do. clear.
13	72	78	82	72	30.15	30.11	30.16	SE.	lt. mod. lt.	72		clds. fr. E. SW. clear.
14	71	78	82	75	30.20	30.15	30.19	SE.	light.	73	0.07	clds. fr. E. clr. w. rain.
15	68	82	86	76	30.24	30.15	30.16	SW.	light.	77	0.09	clds. fr. w. rn. lt. fr. w.
16	71	76	82	76	30.16	30.09	30.09	S.	lt. mod.	72	0.09	clds. fr. SE. clr. E. rn.
17	69	82	81	74	30.06	29.97	29.95	W.S.SE.	lt. mod. lt.	69		clds. fr. NW. cl. lt. frw.
18	67	83	86	89	29.97	29.96	29.95	SE.	lt. str. mod.	70		clear.
19	66	83	86	77	30.00	29.95	30.00	SW.	lt. mod. lt.	66		clear.
20		81	86	77	29 92	29.90	29.93	SW.NNW.W.	lt. mod. mod.	70		clear, cldy.
21		76	72	74	30.02	30.02	30.01	NE.		61		cldy. mod. rain, cldy.
22		72	76	76	29.90	29.89	29.97	E.			0.16	rain, clds. fr. E.
23	67	77	85	78	29.95	29.86	29.90	W.SW.SW.	lt. mod. lt.	67		clear.
24	67	83	84	73	29.95	29.86	29.82	SE.	light.	66	0.09	clear, clds. fr. w. clr.
25	60	64	68	59	30.02	30.01	30.03	NW.	str. str. mod.	37		clear.
26	46	58	63	56	30.11	29.99	29.95	N.NW.NW.	str. mod. lt.	28		clear.
27	50	58	65	60	29.64	29.49	29.54	SW.	lt. mod. lt.	49	0.15	rain, clds. fr. SW. clr.
28	52	68	71	60	29.57	20.56	29.64	W.NW.NW.	mod. mod. st.	48		lt. clds. fr. w.
29	52	58	58	51	29.79	29.80	29.91	NW.	mod. st. mod.	50		clds. fr. w. clr. clr.
30	37	45	56	52	30.15	30.05	30.06	NW.NE.NE.	lt. str. lt.	24		clear.
Mean,	60	71.83	75.47	69	30.00	29.96	29.97	Prevailing, SW. and SE.		56.73	1.20	

METEOROLOGICAL OBSERVATIONS FOR OCTOBER, 1836.

DAYS.	THERMOMETER.				BAROMETER.			WIND.		DEW POINT 10 A.M.	WATER IN INCHES.	STATE OF THE WEATHER.
	S R. MIN.	10 A. M.	3 P. M.	7 P. M.	10 A. M.	3 P. M.	7 P. M.	DIRECTION.	FORCE.			
1	41	60	65	59	29.98	29.96	29.91	SW.SE.SE.	lt. str. lt.	45		clear.
2											0.13	
3	42	56	58	51	29.87	29.77	29.75	NW.N.NE.	mod. mod. lt.	40		clear.
4	44	50	50	46	29.57	29.54	29.52	NE.NW.NW.	light.	43	1.10	cldy. fr. S. rn. E. E.
5	37	38	41	39	29.38	29.45	29.50	NW.	lt. st. st.	33		cldy. fr. NW. rn. do. clr.
6	37	47	52	47	29.77	29.78	29.81	SW.	mod. mod. lt.	27		cldy. fr. SW.
7	39	54	59	53	29.93	29.88	29.95	SW.	light.	42		cldy. fr. SW. clr. clr.
8	45	55	55	53	30.10	30.07	30.10	N.SW.SW.	light.	35		cldy. fr W lt. rn. aft.
9	43	49	52	50	30.16	30.16	30.15	NE.	moderate.	42	0.06	cldy. fr. W. rain.
10	45	52	56	57	30.19	30.15	30.17	E.NE.NE.	mod. st. lt.	35		clear.
11	42	47	47	42	30.14	30.03	30.00	NE.	st. st. mod.	28	1.50	cldy. fr. E. do. do. rn.
12	32	43	51	42	29.80	29.76	29.83	NW.NW.SW.	st. st. lt.	32		cldy. fr. W. do. clr.
13	35	55	59	51	29.97	29.88	29.87	SW.	light.	37		clear.
14	41	55	61	54	29.76	29.68	29.69	SW.S.S.	light.	45		cldy. fr. SW. W. rn.
15	43	54	56	53	29.80	29.76	29.69	NE.SE.SE.	moderate.	29		clear.
16	41	57	56	54	29.67	29.74	29.86	NW.	mod. st. lt.	41		clear.
17	33	53	58	47	29.87	29.87	30.01	SW.NW.NW.	lt. st. mod.	35		clear.
18	34	45	52	48	30.29	30.20	30.21	NW.W.SW.	mod. mod. lt.	25		clear, cldy. fr. W. W.
19	42	57	65	57	29.97	29.77	29.70	SW.	lt. st. lt.	43	0.26	cldy. fr. SW. clear.
20	55	55	50	48	29.40	29.61	29.65	NE.NW.NW.	st. mod. lt.	49		cldy. fr. W. rn. clr. clr.
21	33	43	42	40	29.89	29.90	29.95	NW.	str. str. mod.	20		clear.
22	28	47	52	42	30.20	30.12	30.14	NW.WSW.SW.	st. mod. lt.	15		clear.
23	31	47	56	50	30.16	30.06	30 05	SW.SE.SW.	lt. mod. lt.	39		clr. clr. cldy. fr. W.
24	40	55	70	63	29.98	29.89	29.89	SW.S.SW.	lt. mod. lt.	46		cldy. fr. W. clr. cldy. W.
25	42	43	45	40	30.19	30.18	30.18	N.NE.NE.	st. st. mod.	19		clear.
26	27	38	42	49	30.10	29.92	29.90	NW.	st. mod. lt.	15		clr. cldy. fr. W. W.
27	32	39	38	35	29.66	29.67	29.76	NE.N.N.	light.	22		cldy. fr. W. W. clear.
28	29	40	48	43	29.88	29.75	29.70	W.SW.SW.	lt. lt. lt.	22		cldy. fr. W. clear.
29	35	50	51	45	29.82	29.86	29.97	NW.	mod. st. st.	25		cldy. fr. W. clr. clr.
30	31	43	45	38	30.22	30.10	30.19	NE.NE.SE.	mod. mod. lt.	19		clr. clr. cldy.
31	29	37	43	34	30.26	30.22	30.23	E.SE.E.	moderate.	15		clear.
Mean,	37.6	48.8	52.50	47.33	29.93	29.89	29.91	Prevailing, SW. and NW.		32	3.05	

METEOROLOGICAL OBSERVATIONS FOR NOVEMBER, 1836.

DAYS.	THERMOMETER.				BAROMETER.			WIND.		DEW POINT.	WATER IN INCHES.	STATE OF THE WEATHER.
	S. R. MIN.	10 A. M.	3 P. M.	7 P. M.	10 A. M.	3 P. M.	7 P. M.	DIRECTION.	FORCE.	10 A.M.		
1	25	39	43	39	30.17	30.01	30.02	E.SE.SE.	light.	19		clear.
2	36	40	38	38	29.65	29.64	29.65	NW.	mod. mod. st.	35		rain, clds. fr. E.
3	36	45	46	40	29.78	29.78	29.86	NNW.NN.	st. st. mod.	19		clear.
4	36	39	39	37	29.98	29.97	29.99	NW.	mod. mod. lt.	23		clds. fr. NW.
5	29	39	42	39	29.96	29.92	29.95	NW.	mod. mod. lt.	22		clds. fr. W. do. clear.
6	27	42	48	36	29.98	29.93	29.99	NW.	moderate.	20		clear.
7	26	41	44	39	30.07	29.98	29.99	SSE.SE.SE.	lt. mod. lt.	24		clear, clds. fr. W. do.
8	27	46	52	43	30.04	30.05	30.10	NW.SE.SE.	moderate.	27		clear.
9	34	46	50	43	30.28	30.30	30.35	SE.E.E.	light.	34		clear, clds. fr. W. do.
10	42	52	54	52	30.29	30.25	30.19	E.	mod. mod. lt.	37		clds. fr. E.
11	50	57	61	60	29.97	29.81	29.80	E.S.S.	lt. st. st.	51		clds. fr. E. and S. rain.
12	57	60	58	51	29.73	29.83	29.86	N.NW.NW.	st. mod. mod.	54		clds. fr. SW. clr. clr.
13	37	49	52	47	30.08	29.99	29.99	NW.SE.SE.	light.	34		clear.
14	43	44	44	41	29.88	29.86	29.81	NE.	st. mod. mod.	41	0.84	clds. fr. E. rain.
15	38	45	47	43	29.78	29.77	29.81	NW.E.E.	lt. mod. mod.	35		clr. clds. fr. W. clr.
16	40	44	47	38	29.88	29.83	29.96	W.SW.SW.	moderate.	19	0 08	clr. clds. fr. W. rain.
17	31	37	42	36	30.22	30.20	30.27	NW.	moderate.	14		clear.
18	32	40	43	36	30.40	30.39	30.41	NW.NNW.NNW.	moderate.	17		clear.
19	20	37	42	38	30.50	30.40	30.40	E.SE.SE.	lt. mod. mod.	24		clear.
20	37	42	46	43	30.20	30.13	29.90	E.E.SE.	lt. mod. st.	31	1.37	clds. fr. S. rain.
21	37	46	53	45	29.75	29.71	29.78	NW.W.NW.	moderate.	35		clr. clds. fr. W.
22	41	47	44	41	29.98	29.90	29.89	NW.	mod. mod. st.	27		clr. clds. fr. W.
23	32	37	38	35	29.73	29.71	29.62	SW.	mod. mod. st.	21		clds. fr. N.
24	29	40	40	35	29.57	29.56	29.53	SW.S.SW.	mod. st. mod.	21		overcast, clds. fr. W.
25	28	31	23	20	29.73	29.70	29.83	NW.NW.NW.	st. st. mod.	12		clear.
26	23	27	32	30	29.87	29.88	29.94	NW.	mod. st. st.	9		clr. clds. fr. W. clr.
27	25	32	34	30	30.10	30.06	30.11	NW.	moderate.	12		clear.
28	26	32	34	29	30.10	30.04	29.99	NW.	moderate.	15		clds. fr. W. snow.
29	21	33	34	30	29.77	29.70	29.72	W.NW.NW.	moderate.	11		clds. fr. NW. WNW. clr.
30	27	34	41	34	29.67	29.54	29.56	SW.	moderate.	14		clear.
Mean,	33.06	41.43	43.70	38.93	29.97	29.96	29.94	Prevailing, NW.		25.2	2.29	

METEOROLOGICAL OBSERVATIONS FOR DECEMBER, 1836.

DAYS.	THERMOMETER. S. R. MIN.	10 A. M.	3 P. M.	7 P. M.	BAROMETER. 10 A. M.	3 P. M.	7 P. M.	WIND. DIRECTION.	FORCE.	DEW POINT. 10 A.M.	WATER IN INCHES.	STATE OF THE WEATHER.
1	28	40	35	30	29.66	29.78	29.92	N.N.W.	str. str. mod.	25		cldy. fr. w. clear.
2	20	30	30	26	30.10	30.03	30.05	SW.W.W.	lt. mod.	7		clear.
3	23	32	35	30	30.13	30.05	30.07	W.SW.SW.	moderate.	10		overcast, clr. clr.
4	20	32	38	32	30.14	30.06	30.05	SW.SE.SE.	lt. mod. mod.	14		clear.
5	30	40	47	42	29.85	29.80	29.91	SW.	moderate.	34		cldy. fr. w. clr. clr.
6	27	35	36	30	30.05	30.06	30.15	NW.NNW.NW.	st. st. mod.	16		clear.
7	25	30	31	26	30.07	30.03	30.11	NW.NW.N.	moderate.	11		clear.
8	18	30	35	28	30.19	30.17	30.18	E.	moderate.	15		clear.
9	19	32	46	37	30.14	30.02	29.97	E.S.SE.	lt. mod.	18		clear.
10	42	48	47	41	29.80	29.93	30.03	W.NNW.NW.	mod. st. lt.	44	0.66	cldy. fr. w. rn. clr. clr.
11	30	40	44	38	30.06	29.98	29.97	SW.	lt. mod. lt.	31		clear.
12	30	44	52	44	30.10	30.08	30.09	SW.	lt. mod. mod.	18		clear.
13	36	40	47	51	29.76	29.42	29.35	E.SSE.S.	mod. mod. lt.	34	0.35	cldy. fr. s. rn. ssw. s.
14	39	40	39	37	29.54	29.65	29.74	NNW.NW.NW.	strong.	18		cldy. fr. NW. w. w.
15	30	34	36	30	30.04	30.09	30.14	NW.W.NE.	st. mod. mod.	11		clear.
16	25	30	32	30	30.23	30.07	29.96	E.	lt. lt. st.	14	1.06	cldy. fr. E. w. w. rn.
17	29	40	35	32	29.47	29.65	29.78	SW.NW.NW.	mod. st. st.	35		cldy. fr. w. do. clr.
18	26	28	29	26	30.24	30.28	30.43	NNW.NNW.W.	st. st. lt.	5		clear.
19	16	25	29	27	30.64	30.60	30.59	NW.SE.SE.	moderate.	3		clear.
20	20	32	37	37	30.44	30.23	30.05	E.SE.SE.	lt. mod. mod.	20		cldy. fr. sw. rain.
21	36	37	29	21	29.67	29.97	30.22	NW.	st. v. st. mod.	27	0.98	cldy. fr. w. clr. clr.
22	10	16	20	17	30.62	30.53	30.51	NW.	strong.	—8		clear.
23	9	22	31	30	30.48	30.21	30.22	SE.SSE.SSE.	moderate.	—2		cldy. fr. w.
24	20	32	37	33	30.30	30.29	30.30	NW.NW.E.	light.	10		clear.
25	29	35	37	36	30.28	30.16	30.12	SE.	light.	31		cldy. fr. w. rain.
26	34	35	32	27	30.09	30.07	30.14	NW.	mod. mod. st.	31	1.15	cldy. fr. w. rn. sn.
27	18	22	22	17	30.27	30.26	30.33	NE.NW.NW.	mod. st. st.	2		hazy, clr. clr.
28	9	18	22	17	30.32	30.24	30.21	NW.NE.NE.	moderate.	—5		clear.
29	16	28	37	30	29.99	29.89	29.93	SW.	light.	10		clear.
30	24	25	26	24	30.29	30.30	30.32	NE.	moderate.	7		clr. cldy. fr. NW. do.
31	23	28	30	28	30.25	30.10	30.05	SE.ESE.ESE.	moderate.	11		cldy. fr. NW. clr. clr.
Mean,	25	32	36	31	30.09	30.06	30.13	Prevailing, NW. and SW.		16	1.29	

DONATIONS TO THE LIBRARY.

1836.—*February* 4. Two volumes of the Transactions of the American Phil. Society.—By Dr. J. R. N. Dunbar.

A Manual of the Practical Naturalist.—By George W. Andrews.

Feb. 11.—Renwick's Elements of Mechanics.—by Dr. Aikin.

Feb. 18.—Lea's Observations on the genus Unio; and a copy of Genera Crustaceorum et Insectorum, by Latreille.—By Dr. Geddings.

Feb. 25.—A copy of Lehman's Jungermania; of the Baltimore Medical and Surgical Journal; and of the North American Archives of Medical and Surgical Science.—By Dr. Geddings.

Histoire des Oiseaux d'Afrique, par Levaillant, two vols. folio.—By Mr. J. H. Alexander.

March 3.—Meteorological Observations for the years 1822-23-24 and 25, by the Surgeons of the U. S. Army; also Examination of the Coal Measures, of Allegany county, Maryland.—By Professor Ducatel.

The State Librarian's Report to the Governor, upon the collection of documents, papers, &c. ordered to be deposited in the Council chamber.—By Mr. Alexander.

De Anima Brutorum.—By Dr. Willis.

A diagram of the Human Eye.—By Mr. Green.

A Map shewing the connection of the Baltimore and Ohio Rail-road with other rail roads, executed or in progress, throughout the United States.—By Mr. Fisher.

March 17.—Musæum Hermeticum; and a Report on the new map of Maryland, for 1834.—By Mr. Alexander.

Experiments with the Elementary Voltaic battery, by James B. Rogers, and James Green.—By Mr. Green.

March 24.—Description of the Fossil Elk, of Ireland; also Featherstonhaugh's Report, to the Secretary of war, for 1834.—By Dr. Macaulay.

March 31.—Tractatio Astronomica; and documents relating to the Survey of the Coast of the United States.—By Mr. Alexander.

Notice of the Academy of Natural Science of Philadelphia.—By Mr. T. A. Conrad, of Philadelphia.

Report of a Geological Reconnaissance of the state of Virginia, by Wm. B. Rogers.—By Mr. James E. Heath, of Richmond.

April 7.—A Synopsis of the Flora of the western states, by J. L. Riddell.—By Dr. J. B. Rogers.

Plates to Barton's Flora.—By Messrs. Tyson and Fisher.

Opinions on various subjects.—By Wm. Maclure, Esq. the author.

April 14.—Medical and physical Researches, by R. Harlan, M. D.—By Dr. Harlan, Philadelphia.

Annual Report of the Regents of the University of the State of New York. By Dr. James Eights, N. York.

Method of computing the observation of an Eclipse of the Sun, published by St. Mary's College, Baltimore.—By the college.

Proceedings of the Imperial Mineralogical Society of St. Petersburg, eleven numbers; and the Constitution of the Lyceum of Natural History, of New York.—By Charles Cramer, Esq. New York.

April 21.—Text book of Chemical Philosophy, by Jacob Green; Traité de Chimie, par L. J. Thenard; Systema vegetabilum, par Linné; The American Dispensatory, by J. R. Coxe, M. D.; Collections for an Essay toward a Materia Medica of the U. S. by B. S. Barton.—By Mr. E. Durand, Philadelphia.

Statistical Essays, 2 vols. by Stephen Hales; Agricultural Chemistry, by Sir H. Davy; An Essay on the ultimate principles of Chemistry, Natural Philosophy and Physiology, by Lardner Vanuxem; Essays, Physical and Chemical, by Lavoisier, vol. 1, translated by Thomas Henry; Treatise on the nature and properties of air, by Cavallo.—By Dr. Coale.

April 28.—Six printed copies of Meteorological Observations, for Feb. 1836. By Dr. Edmondson.

A copy of the Notice of the Academy of Natural Science, of Philadelphia, recently published by them.—From the Academy.

May 5.—A copy of a statistical view of the United States, published under the direction of the secretary of state.—By the Hon. R. H. Goldsborough.

A copy of a treatise on the early Portuguese Navigators.—From J. José da Costa de Macedo, perpetual secretary of the Royal Academy of Sciences, at Lisbon.

May 19.—Experiments on the navigation of the Chesapeake and Delaware Canal by steam, by Professor Bache; An Introductory Lecture, delivered at the Chemical Hall, of the University of Maryland, by Professor Ducatel; New theory of Terrestrial Magnetism, by S. S. Metcalf, M. D. New York.—By Mr. Fisher.

A table of Meteorological Observations for the month of April, 1836, made at that place.—By Dr. J. W. Greetham, of Mount Vernon, Ill.

May 26.—Account of the medicinal properties of the Gray Sulphur Springs, Virginia; also Mnemonic System of Nomenclature, by J. L. Riddell.—By Prof. Ducatel.

June 2.—A plate representing the animals which formerly inhabited the present site of the Jura Mountains; Report of the Engineers of Mines, France, 1834; also Report of the Rail road Company from Paris to St. Germain, with three plates.—By Prof. Ducatel.

Twelve volumes, 4to. of their Transactions.—By the Royal Academy of Sciences, of Lisbon.

Vindiciæ Hibernicæ; Carey's Miscellanies; and Carey's Biography, two copies each.—By Matthew Carey, Esq. Philadelphia.

July 1.—A Memoir on the nature of Miasma and Contagion.—By Dr. Riddell, Cincinnati.

Catalogue of Plants growing without cultivation in the vicinity of Troy, New York.—By Drs. Wright and Hall.

August 4.—A Treatise on the principal Mathematical Instruments employed in Surveying, by F. W. Simms, with additions, by J. H. Alexander.—By Mr. J. H. Alexander.

September 1.—The Book of Exodus, in the language of the Sandwich Islands. By Dr. Coale.

Several Scientific Tracts.—By Dr. Riddell.

Harlan's Medical and Physical Researches.—By Wm. Maclure, Esq.

A large collection of Pamphlets and several volumes of his works.—By Matthew Carey, Esq. Philadelphia.

October 6.—The method of using Chloride of Soda, translated from the French of Labarraque.—By Dr. Jacob Porter.

Oct. 13.—Catalogue of Plants growing in the vicinity of Troy, and a Report of the Geographical Society of Brussels.—By Charles Cramer, Esq.

Oct. 27.—Webster's Manual of Chemistry.—By Dr. Coale.

November 3.—Memoire sur les fourneaux fumivores; and Statistical Reports, presented to the Minister of Commerce, in France, 2 nos.—By Prof. Ducatel.

A copy of his Oration before the American Institute of Instruction.—By Prof. W. R. Johnson, Philadelphia.

Fourteen odd volumes of the Encyclopēdie Methodique; Description of Sierra Leone, by himself, 1 vol.; and The Four Ages of Life, from the French of Count Ségur, 1 vol —By Chevalier Figanière.

A copy of Godman's Natural History.—By Dr. Dunbar.

December 1.—Eight volumes of Tilloch's Philosophical Magazine.—By. Mr. Charles Z. Lucas.

Dec. 8.—A copy of the Museum Icthyologium of Gronovires.—By Professor Ducatel.

A collection of folio documents.—By M. Carey, Esq. Philadelphia.

Dec. 22.—Their Catalogue.—By the Academy of Nat. Science, Phil.

Dec. 29.—Report of the Survey of the lands of the George's Creek Coal and Iron Company.—By Mr. P. T. Tyson.

1837.—*January* 5.—A catalogue of Alpine Plants.—By Mr. C. Z. Lucas.

A Summary of his Meteorological Observations in Baltimore, for the year 1836.—By Capt. L. Brantz.

Jan. 12.—Euclid's Principia, in Greek; Ainsworth's Latin Dictionary; and two volumes of the Museum of Literature and Science.—By J H. Quinby.

Jan. 19.—Eight volumes Archives des Decouvertes et Inventions nouvelles; three vols. Manual de Chimie, par Bouillon Lagrange; four vols. Histoire Naturelle de Chimie, par Fourcroy; two vols. Traité de Chimie elementaire, par Thénard; three vols. Systēme de Connaissance Chimique, par Fourcroy; one vol. Tableaux Synoptiques de Chimie; Featherstonhaugh's Geological Report for 1835; Rogers' Geological Report of the Survey of New Jersey, 1835; Report on the Explosion of Steam Boilers, by the Franklin Institute; Disputatio Physica Inauguralis de terra natorum vegetatione, by Samuel S. Griffin; Cabinet of Natural History and American Field Sports; Memorial Encyclopedique et progressif des connaissances humaines.—By Prof. Ducatel.

'Introductory Lecture, delivered at the Medical Hall of the University of Maryland, 1836.'—By Prof. Griffith.

A copy of the Strictures on Ingersoll's Letter.—By Mr. John D. Toy.

A number of their Transactions.—By the Lyceum of Natural History, of New York.

A number of their Transactions.—By the Academy of Natural Sciences, of Philadelphia.

Report of the Meteorological Observations, made at Albany.—By the Albany Institute.

Higgins on the Earth.—By Mr. Quinby.

Jan. 26.—Philosophica Brittanica, 3 vols. 8vo.—By Mr. Minifie.

A series of Thermometrical Observations, made in the state of New York, from 1829 to 1831, and also in Maryland, from January 1834, to July 1835.—By Dr. Aikin.

Several Treatises in Italian, on volcanic and other phenomena, by Gemellara; Geological Survey of Nova Scotia, by Alger and Jackson; Description of Mastodon's Bones, and history of their exhumation, by R. Peale.—By Dr. Cohen.

Feb. 2.—Four pamphlets on literary subjects.—By Mr. Quinby.

Feb. 9.—Berzelius' Nouveau Systême de Mineralogie.—By Prof. Griffith.

Three parts of the Boston Journal of Natural History,—By the Boston Natural History Society.

Feb. 16.—Topographical description and Historical sketch of Plainfield, Mass.; also, Instructions and Observations in the use of the chlorides of Soda and Lime, translated from the French.—By Dr. Porter.

Experiments on the fusing point of zinc, and the fusibility of metals in general.—By Prof. W. R. Johnson, of Philadelphia.

Report of the United States' Geologist, for 1836; also Geological Report of the state of Ohio, 1836.—By Prof. Ducatel.

Feb. 23 —Dr. Mitchell's Discourses on the lives and characters of Thomas A. Emmet, and De Witt Clinton.—By Dr. Aikin.

March 2.—Report on the New Map of Maryland for 1836; also several pamphlets.—By Prof. Ducatel.

Description of two new species of Trilobites.—By Jacob Green, M. D.

March 9.—Eaton's Botany, sixth edition.—By Dr. Aikin.

Tableaux de distribution méthodique des espèces Minerales, by Brogniart. By Mr. P. T. Tyson.

March 16.—First report on the Geology of New York.—By Prof. Hall, of New York.

March 30.—Murray's Chemistry, 2 vols; Accum's Chemistry, 2 vols.; Parr's Medical Chemistry; Parr's Chemical Catechism.—By Dr. Cleveland.

Address of Dr. Dunglison.—By Prof. Ducatel.

Bibliotheca Americana.—By Mr. F. Lucas, Jr.

April 6.—Physiologie Vegetale, 5 vols.—By Mr. E. Durand.

First Annual Report on the Geology of Pennsylvania.—By Prof. Rogers, of Philadelphia.

April 20.—Green's Monograph of the Trilobites of N. A.—By T. R. Jackson, Esq. of Philadelphia.

Annual Report of the Regents of the University of New York.—By M. H. Webster, Esq. Albany.

Catalogue of Plants, growing in St. Helena.—By Dr. Palmer, U. S. N.

May 4.—An account of the improvements going on in the United States. By Mr. Chevalier of Paris.

May 18.—Pamphlet published by the geologists of the state of New York. by Prof. Ducatel.

Six copies Meteorological Reports.—By Capt. Brantz.