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Dr. Smart of Washington who was present gave some interesting points on the subject of the sanitary analysis of drinking water and a brief history of the development of chemical analysis as a phase of the work.

December 7, 1886.

Thirteen persons present.

Corresponding Secretary W. H. Leonard presided.

N. H. Hemiup read a paper entitled "Some notes on the inhabitants of Terra del fuego: the lowest type of the human family."

The paper was followed by a discussion participated in by several members.

N. Kolkin and Geo. Davis each occupied a few minutes time in stating to the Academy some views which they deemed of importance.

[*Paper A.*]

SOME EARLY PHILADELPHIA BOTANISTS; SCHWEINITZ, NUTTALL, RAFFINESQUE AND DARLINGTON.—*W. E. Leonard.*

SCHWEINITZ.

The Rev. Lewis David von Schweinitz, whose name is identified with some 200 species of plants, and 1,200 species of fungi, was practically a Philadelphian, although a resident of Bethlehem, Pa.

He was born at the latter place, February 13th, 1780, and died in the same, February 8th, 1834, lacking but five days of completing his fiftyfourth year.

At 18 years of age he went to Germany for his education, and returned when 34 years old (in 1812) as a Moravian minister to Salem, N. C., and nine years later to his native town of Bethlehem.

Of his life I am not able to learn many particulars, but the results of his incessant labor are left for us to contemplate.

As mentioned above he added 1,400 entirely new species to Botany, 1,200 being North American fungi. His printed works are as follows:—*Conspectus Fungorum Lusatie*—Leipsic, 1805
Synopsis Fungorum Carolinae Superioris—Leipsic, 1818, edited by Dr. Schwargricken—*Specimen Florae Americae Septentionalis*,

Cryptogamicæ—1821, Monograph of the Linnaean Genus *Viola*—Silliman's Journal, 1821. Catalogue of Plants Collected in the N. W. Territory, by Thos. Say, Phila., 1821. Synopsis Fungorum in America Boreali Media Ingentium. Monograph upon the American Species of the Genus *Carex* (the Sedges) New York, 1825, and Synopsis Fungorum in America Boreali Media Ingentium, Philadelphia, 1832.

On his death in 1834, Schweinitz bequeathed to the Academy of Natural Sciences, Phila., his great collection, made during a period of forty years.

This herbarium contained, besides the Cryptogamous plants, 23,000 species. It remains at this day, almost fifty years later, the largest personal collection among the 90,000 species represented in what Dr. Darlington termed "one of the richest and most valuable herbaria in the United States."

Schweinitz laid all his scientific friends under tribute to gather together this magnificent collection. Most of the American species were collected by himself; but many were supplied by Dr. Torrey, M. LeConte, Rev. Mr. Dencke, Mr. J. Elliot, Mr. H. Steinhaur, and other correspondents. The European species were supplied by Mr. Van Welden, Dr. Hooker, Mr. Bentham, Dr. Schwarzenbach, Dr. Stendel, Dr. Zeyher and Mr. Brongniart. The Siberian plants were furnished by Mr. Ledebour, and those of India by Dr. Wallich and Mr. H. Steinhaur. The Chinese collection was made by Mr. Jas. Read. The plants of the polar region were collected by Captain Parry and presented by Dr. Hooker; an interesting collection from Labrador was added by Mr. Kohlmeister, a Moravian missionary of that country. The South American species were obtained chiefly through M. Von Martius, Dr. Huffle and Dr. Constantine Hering. Dr. Baldwin contributed 3,000 species of plants collected by himself in Buenos Ayres, Florida and other parts of North America.

NUTTALL.

Dr. Thomas Nuttall, an ardent and distinguished American botanist, whose collections also remain to us in the Phila. Academy of Sciences, was born in Yorkshire, England in 1786, and died in St. Helens, Lancashire, September 10th, 1859, being 73 years of age. His trade was that of a printer, but early in life he came to the U. S. as a student of natural history, and especially of botany and geology.

While still a young man he travelled extensively in this country. He explored the Great Lakes, and the upper branches of the Mississippi; in 1810 he ascended the Missouri as far as the Mandan villages.

In 1819 he explored the Arkansas river and neighboring regions, and published a "Journal of Travels into Arkansas Territory" in Phila., 1821.

He also travelled on the Pacific Coast, and published several papers on the shells and plants of that region. From 1822 to 1824 he was Prof. of Natural History at Harvard College and Curator of the botanical gardens. He subsequently returned to England and lived on an estate at Nutgrove Lancashire, bequeathed to him on condition that he should reside there during the remainder of his life.

His principal works are:

"A Manual of the Orinthology of the United States and Canada," 2 Vols., 12 mo. Boston, 1834, and "The North American Sylva," 3 Vols., 8 mo., Phila., 1842-9, contemporaneous with Micheax' great work on the forest trees of North America.

In the Academy Museum at Phila. are 3,000 species of North American plants presented by Dr. Nuttall, besides his entire exotic herbarium, embracing among others 1,500 Cape plants collected by Marson, a large number of New Holland plants, and many interesting species from New Zealand and the islands of the Pacific, collected by Foster, Labillardier and others.

Subsequently Nuttall presented to this museum a complete suite of specimens collected by him in his arduous journey across the Rocky mountains to the mouth of the Columbia River, different parts of California, and the Sandwich Islands.

Dr. Nuttall did much work before taking up his residence in England in classifying and arranging the large botanical collection of the Philadelphia Academy.

He also contributed largely to the Academy collections in Conchology and Mineralogy.

RAFINESQUE.

Another botanist of merit whose chief home was in Philadelphia was Constantine S. Rafinesque. His life almost entirely given up to science, but a mistaken ambition greatly obscured his work. He was born in 1784, at Galeta, a suburb of Constantinople inhabited by Christian merchants and traders, his father being a

French merchant of Marseilles. For any notes concerning his early career, I am at a loss since his autobiography, entitled "A Life of Travel and Research," is not accessible. However, from a "notice of the Botanical Writings of the late C. S. Rafinesque" written for the American Journal of Science in 1841, by Prof. Asa Gray, and quoted in the Botanical Gazette for January, 1883—for which I am chiefly indebted for the material of this sketch—we learn that Rafinesque came to this country in 1802. Here he remained three years, which time was occupied in exploring our Atlantic coast and in travelling on foot over much of the territory between Northern Pennsylvania and Virginia. At the time of his coming the botanical field was all his own for no one made any pretensions to the knowledge he possessed. With an ample fortune at his command his opportunities for original work were unequalled. But in 1805 he returned to Sicily where he published three scientific works in French. He did not again see America until 1815, when he was shipwrecked off the coast of Long Island and lost his collection of plants and the balance of his fortune. Here he became a teacher and remained until his death in 1840. On this his second coming he found such botanists as Pursh, Nuttall, Elliott, Bigelow, etc., at work. It may be a gratuitous supposition, but I suspect that the knowledge that the workers just mentioned had accomplished much that he might have done made him rather too caustic in his criticisms of them, and these his criticisms led later critics to omit some honor that was really his due. Yet to his credit be it said, he often praised those he had criticised, and, if unwise in his discourtesy, was not embittered by malice.

During the twenty-five years of his life in the United States, he explored most indefatigably from Vermont to Virginia and westward to the Wabash river. In 1819 he was appointed Professor of Natural Sciences in the University of Lexington, Kentucky, where he remained for seven years. In this time he claims to have explored the state thoroughly and made excursions into the neighboring states north and south.

He finally settled in Philadelphia, and in 1832, when 48 years of age, established the "Atlantic Journal and Friend of Knowledge" of which eight numbers appeared.

His chief published books are as follows:—

Annals of Kentucky, 8 vo., Frankfort, 1824. Medical Flora of U. S., 2 vols. 12 mo. Phila., 1836, and A Life of Travel and Re-

search, 1836. Besides these Prof. Gray enumerates some 27 titles, principally magazine articles and pamphlets.

The writings of C. S. Rafinesque on Recent and Fossil Conchology have been edited by W. G. Binney and G. W. Tyson, Jr., 8 vo. Phila., 1864. During his last years Rafinesque was engaged chiefly in exploring South New Jersey and the pine barrens.

That Rafinesque was an active worker in the field no one will doubt from the above brief account of his travels. Many amateur botanists will appreciate his daily trials as thus quaintly portrayed in an introduction to his "New Flora of North America:"—

"Mosquitoes and fleas will often annoy you or suck your blood if you stop or leave a hurried step. Gnats dance before the eyes and often fall in unless you shut them; insects creep on you and into your ears. Ants crawl on you whenever you rest on the ground, wasps will assail you like furies if you touch their nests. But ticks, the worst of all, are unavoidable whenever you go among bushes, and stick to you in crowds, filling your skin with pimples and sores. Spiders, gallineps, horse-flies and other obnoxious insects, will often beset you, or sorely hurt you."

Evidently Rafinesque had no taste for entomology! Yet he knew the opposite side of this picture, for he well describes the pleasant excitement of finding "new things."

Rafinesque is sorely criticised and justly too, it would seem, by Prof. Gray, for being too ambitious to establish new genera, without regard to previous authorities, and having solely in view the slightest deviation in leaves or floral organs. He insisted that new species and genera are being constantly produced by the deviation of existing forms. This view was certainly in advance of his age and does great credit to his powers of observation. But he absurdly gave estimates as to the time in which these changes were made, stating that from thirty to one hundred years was the average time required for the production of a new species, and five hundred to a thousand years the time required for a new genus.

Hence he thought that the business of establishing new genera and species would be endless, and set himself manfully to work in his "Flora Telluriana" to establish 1,000 totally new genera. He had the pernicious habit of forming genera and species upon very imperfect descriptions by unreliable observers of

forms which he had never seen. Furthermore, by dissecting the works of such men as Pursh, Nuttall, Elliott, Torrey, etc., he converted their doubtful forms into new species. Thus out of Dr. Torrey's account of the plants collected by Dr. James in Long's expedition, Rafinesque constructed 30 new genera. He furnishes probably the only instance of a botanist persistently desiring to dedicate a genus to himself. The genus proposed just as persistently refused to stand, and in despair he provides half a dozen Rafinesquias from which botanists may take their choice. None of these are to be found in the last edition of Gray's Manual.

Of the 3,000 new genera which this botanist boasts of having established only a paltry 13 have stood the fire of criticism in the region covered by Gray's Manual, viz:—

Adlumia—Climbing Fumitory (Fumariaceae.)

Polanisia—Polanisia (Caper Family.)

Cladrastis—Yellow Wood (Leguminosae.)

Osmorrhiza—Sweet Cicely (Umbelliferae.)

Lepachys— (Compositae.)

Erechthites—Fireweed “

Ilysanthes— (Scrophulariaceae)

Blephilia—Blephilia—(Labiatae.)

Peltandra—Arrow Arum—(Araceae.)

Clintonia—Clintonia—(Liliaceae.)

Diarrhena—Diarrhena—(Gramineae.)

Eatonia— “

Pachystima

And of all these Bentham and Hooker have slain some. [Of these genera, nine, viz., Polanisia Osmorrhiza, Erechthites, Lepachys, Diarrhena, Eatonia, Ilysanthes, Blephilia, Clintonia are found in the catalogue of the plants of Minnesota now being brought up to date by Mr. Warren Upham.]

While deserving credit for being an excellent and indefatigable observer, Rafinesque should undoubtedly be held up before the young botanist of today as the type of a species maker whose tendency was to so magnify every slightest deviation from the type that to him it meant a new genus or species.

The results of Rafinesque's labors remaining to us today are to be found in the botanical museum of the Academy of Natural Sciences of Phila., being that portion of his herbarium containing the specimens from which descriptions in his Medical Flora have been made; presented by Mr. Wm. Hembel.

In spite of all that is unfavorable concerning the labors of Rafinesque, Mr. Thos. Meehan, the well known botanist of Germantown, in the *Botanical Gazette* above referred to (Feb. 1883.) would have us a little more charitable with the memory of an able worker so long since passed away. He would have us remember that other botanists have also manufactured species, that other men have been and are still egotistical, and that Rafinesque endured rarely paralleled misfortunes, and sacrificed a large fortune for the sake of science.

Truly we may well be saddened and made forgetful of his faults when we read, on the authority of Mr. Meehan, who remembers the contemporaries of Rafinesque, that the eccentric botanist lived, in his latter days, in a dingy garret, with scarcely a loaf of bread to eat, working for science as he understood it, to the very last. On September 18, 1842, he died on a cot, with scarcely a rag to cover him, and without a solitary friend to stand by him in his last hours. Bringhurst, a kind-hearted undertaker, committed his body to the earth, and for years a pine board with C. S. R. was all that marked his last resting place.

Mr. Meehan concludes his brief defense, as follows: "Let us meet in spirit around his unhonored grave in old Ronaldson cemetery, remembering his sacrifices, grateful for what he did and tried to do, and not forgetting that we too are human as was he."

DARLINGTON.

Wm. Darlington, M. D., the noted botanist of West Chester, Pa., was born in Birmingham, Pa., April 28, 1782, and died in West Chester April 23rd, 1863.

At 22 years he received the degree of M. D. from the University of Penna. For two years thereafter he studied languages and botany, and in 1816 went as ship's surgeon to Calcutta. His first literary attempt grew out of this voyage in the shape of *Letters from Calcutta*, published in the *Analectic Magazine*.

On returning the Dr. settled down to practice in his adopted town, West Chester. Incidentally to his career as a botanist ought to be mentioned the fact that in 1812 he became a major of a volunteer regiment, and that he served as a member of Congress in 1815-17 and 1819 to '23.

In 1812 Dr. Darlington founded at West Chester an Academy, an Athenæum, and a prosperous Society of Natural History, of

which he was the first president. A year later the Doctor's botanical tastes first displayed themselves by his beginning a descriptive catalogue of the plants growing about West Chester. This was published in 1826, under the title *Florula Cestrica* enlarged in 1837 as *Flora Cestrica* and again in 1853 made complete for the entire county of Chester.

This book is a standard local authority, so compiled as to suit both amateur and scientist. (I once had the pleasure of consulting a copy in the Merchantile library of Philadelphia.)

Dr. Darlington had made many friends in his favorite science, for in 1853, a rare and curious genus of pitcher plant was called for him—*Darlingtonia Californica*.

His botanical works are:—

Agricultural Botany—or strictly American Weeds and Useful Plants,—published first in 1847, Agricultural Chemistry, (1846) and (his last works) *Notae Cestrienses*, the latter being a series of observations on the flora and natural history of Chester Co.

Besides these, a treatise on the Mutual Influence of Habits and Disease and several memoirs of personal friends—Baldwin, Bartram and Marshall, all men interested in the Phila. Academy of Sciences—came from his pen.

Let me read from the Dr.'s American Weeds, etc., two paragraphs to show how broad a field Botany embraced in his mind and how all persons should be more or less instructed therein.

"It is a great mistake, in my opinion, to suppose that the significant language of our science must necessarily be merged in the vernacular idiom or degraded into the local *patois*, in order to adapt it to the capacities of intelligent practical men * * * Instead of *writing down* to the level of boorish comprehension, I would rather see agricultural works gradually written up to the scientific standard.

* * * * *

"The study of botany, in its widest sense—comprising as it does, the entire vegetable creation—will ever have its select votaries in those who appreciate its manifold charms, and find their reward in the pleasures incident to the present. But when regarded in a more limited and practical point of view, it may fairly challenge the attention even of the most inveterate utilitarians. There are three aspects, or relations of the science in which its importance will scarcely be denied by the most penurious calculator of econom-

ical values—namely: 1, agricultural botany; 2, medical botany; and 3, artistical botany; or the history of those plants which are employed, or afford material in the process of the arts of manufacturers. The medical branch has been treated of with something like system; the other two divisions with less frequency and less method. * * * The botany of the arts, whenever undertaken, will afford a highly interesting theme for some future laborer in this elegant department of natural history”.

Preface to the first edition—pp. II. or XI.

[Paper B.]

NOTES ON SOME OF THE RARER PLANTS FOUND IN BLUE EARTH AND PIPESTONE COUNTIES, MINNESOTA, DURING THE SUMMER OF 1882.

—John Leiberg.

Among the many rare and interesting plants found during the summer of '82 in Blue Earth and Pipestone counties, a few deserve especial mention from the fact that no other observer has as yet recorded their occurrence in Minnesota.

The first and possibly the most interesting is the Buffalo grass, *Buchloe dactyloides*, Engelm. This grass was found in abundance upon the rocky ledges that come to the surface near Pipestone City. Associated with this grass were two species of cacti, *Opuntia missouriensis* and *fragilis*. To the occurrence of these two species of cacti is no doubt to be attributed the survival of the buffalo grass at this place, which, but for the protecting power of the long and sharp spines with which these cacti are armed, would long since have been stamped out by cattle. It is very remarkable that this grass should occur so far to the northeast, and it is a question if this station be not the farthest northeast point reached by it. It is hardly possible that it is a native of this place, more probable would be the supposition that to the Indians from the western plains who have come here to quarry the pipestone its introduction is due. Here and there growing in the hollows and fissures of the ledge we find *Beckmannia erucaciformis*, Host. A curious grass with the general appearance of a *Paspalum*, also a native of the plains. Growing very sparingly on the driest and rockiest spots we find another rather rare grass, *Lepurus paniculatus*. This grass is generally associated with salines