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It may be remarked, with reference to plant forms, that the boreal flora of that epoch, not being at all menacing, could furnish little food for superstition, and no drawings of plants are found in the caves.

On the whole, the condition of the art of design with primitive man appears to be in complete harmony with the meaning we have attributed to design itself—it being regarded as inspired by the belief in the existence of a material relation between a being and its image, and in the possibility of acting on the object by means of the picture.

Consequently, the principle of painting is not to be found in a natural tendency of primitive man to the artificial imitation of living Nature, but seems to be derived from the wish to subject that Nature to its wants and to subdue it.

By progressive improvements, the art of drawing has gradually lost its primitive significance and original meaning till it has become what it is now. It does not differ, however, much from what it was originally; for, while primitive man fancied he could reach the living being in its image, it is still life that living man seeks to-day in works of art.—*Translated for The Popular Science Monthly from the Revue Scientifique.*



SKETCH OF L. D. VON SCHWEINITZ.

DURING colonial times in America, and even down into the present century, science advanced over a much obstructed path. Not having then attained to its present power and esteem, there were but few of its votaries whose whole time and best energies it could command. The explorations by which the animals, plants, and minerals of the vast Western continent were made known to science were accomplished in large part by naturalists who either followed some other vocation as a means of livelihood, or were mainly occupied by some other career to which they felt more strongly bound. Franklin was a printer and later a statesman, being an electrician only at odd times; John Bartram was a farmer; Mitchell, Hosack, and Barton were physicians; while Muhlenberg and the subject of this article were clergymen.

LEWIS DAVID VON SCHWEINITZ was born, February 13, 1780, at Bethlehem, Pa., then a Moravian Church settlement which had been founded by his family in 1741. His father, Baron Hans Christian Alexander von Schweinitz, came from an ancient and distinguished family residing on the ancestral estate called Leubla, in the present limits of Saxony. That he was a man of stable

character may be inferred from the fact that he performed the responsible duties of a treasurer general for the Moravian Church in America. The mother of Lewis was Dorothea Elizabeth, daughter of Baron (afterward Bishop) John de Watteville, and Benigna, daughter of Lewis Nicholas, Count Zinzendorf. It was to Zinzendorf and Watteville that the renewal and resuscitation of the ancient church of the *Unitas Fratrum*, or Moravian Brethren, in the eighteenth century was mainly due. In 1722 two families of the Brethren crossed the frontier of Moravia by night and made their way to the estate of Count Zinzendorf in Saxony. Here they were joined by others, and in a few years the town of Herrnhut was built by the colonists. Zinzendorf took an interest in this settlement from the start, became a bishop in the church, and devoted his life to its service. The efforts of the Brethren were early turned toward foreign missions, and it was in furtherance of mission work that Zinzendorf and Watteville came to America and founded the first Moravian settlements in this country.

Being so closely connected with the re-founders of an ancient denomination, the parents of Lewis naturally looked forward to his becoming an able promoter of the interests of their church. He was their eldest son, of a decidedly intellectual temperament and an enthusiastic disposition, and when in early boyhood he developed the habit of addressing short speeches and little sermons to the family circle, his future seemed to be definitely marked out.

When a little more than seven years old, Lewis was placed in the academy of the Moravian community at Nazareth Hall, where he remained eleven years. Young Lewis received his first impulse toward scientific study when on a visit to this school with his grandfather, Bishop de Watteville, before he entered it as a pupil. Seeing a specimen of the *Lichen digitatus* lying on a table, the child examined it with interest, and was told its name and something about its physiology. From that moment he was wont to date his interest in the vegetable kingdom. After entering the school he received some instruction in the elements of botany. A partial flora of Nazareth and vicinity, made while he was at this institution, which remained among his manuscripts at his death, is evidence that this study took immediate hold upon the mind of the youth. During his school days his powers of language and his vein of satirical humor were occasionally manifested in poetical effusions. While still a pupil and not yet eighteen years of age he assisted in teaching some of the younger classes. Lewis had three brothers, none of whom ever turned to scientific pursuits, and two sisters.

In 1798 Hans von Schweinitz was called to Germany and took

his family with him. Lewis was removed from the Nazareth seminary and after the family reached Germany was entered as a student in the theological institution at Niesky, in what was then known as the province of Lusatia, in Silesia. Here he made the acquaintance of Prof. J. B. de Albertini, who became his fast friend and his fellow-worker in botanical investigations. After completing his course as a student he became a teacher in the academy. His leisure at Niesky was occupied in the pursuit of his favorite science, in general reading and study, and in writing for the literary journals of the time. In his *Memoir of von Schweinitz*, read before the Academy of Natural Sciences of Philadelphia, Walter R. Johnson says of his literary activity at this time: "Scarcely any important topic in the wide field of science escaped his notice, and especially did the constitution and management of the affairs of his social and religious fraternity call forth from his pen many able and spirited articles."

The first published botanical work of von Schweinitz appeared in 1805, when he was twenty-five years of age. From the beginning of his residence at Niesky he had given especial attention to the fungi, previously little studied. The association with Albertini had continued and the discoveries of the two friends in this field had been so many as to warrant the publication of a volume of about four hundred pages on the fungi of Lusatia embodying the results of their united efforts. It was written in Latin, as was still the custom for scientific works in Europe, and the twelve plates, containing figures of ninety-three new species, with which it was illustrated, were drawn and engraved by von Schweinitz's own hands. In this work the authors creditably refrained from the then too common practice of giving new names to the already known plants included in their descriptions. They were convinced that natural history had been grievously burdened by the accumulation and confusion of synonyms, many of which promoted no other purpose than an unworthy ambition.

Soon after this Mr. von Schweinitz began to preach, and in 1807 was called to the Moravian settlement at Gnadenberg, not far from Niesky. "Considered as literary performances," says Johnson, in the memoir already cited, "his sermons were characterized by the utmost simplicity, both in style and delivery, and were addressed more to the heart than to the head. His discourses were invariably practical, not argumentative—experimental, not speculative." It was now the time of Napoleon's continental wars, and troops were quartered at Gnadenberg. The inhabitants found the presence of the soldiery irksome, but the happy disposition and winning deportment of the young pastor had much influence in preventing collisions. The next year he was invited to Gnadau, in Saxony, where he remained four

years, performing the duties of his clerical office and teaching the boys of the community who were destined for learned professions.

In 1812 Mr. von Schweinitz, being then thirty-two years of age, was appointed general agent of the Moravian Church in the southern United States. Before starting for this country he married, at Niesky, Louiza Amelia Le Doux, who belonged to a French family residing at Stettin. The continental system of Napoleon rendering direct communication with the United States extremely hazardous, Mr. von Schweinitz and his wife were compelled to go through Denmark to Sweden and embark there. The trouble of making this roundabout journey was, as it chanced, not without its compensation. The travelers were obliged to make a stay of some length at Kiel, in Holstein, during which von Schweinitz formed an enjoyable acquaintance with several of the professors in the university there. His attainments, moreover, so impressed the authorities of this seat of learning that they conferred upon him the honorary degree of Doctor of Philosophy. When, at length, the voyage was begun the United States had declared war with England and the sea swarmed with privateers. The passage abounded with thrilling adventures and providential escapes. While still in European waters the vessel fell in with a French privateer and narrowly avoided capture by taking refuge under the guns of a Danish fort. A fierce cannonade between the Danes and the Frenchman followed, many of the balls passing over and through the ship. Later it was actually captured by a British frigate, but escaped in the darkness and fog of a stormy night. Much tempestuous weather was met with, and the climax came in a terrible storm which dismasted the vessel. Nevertheless, it finally entered port in safety, being the only one of fifteen or twenty American vessels sailing from Sweden on the same day that ever reached America.

The principal church settlement of the district to which von Schweinitz had been assigned was at Salem, N. C., and there he took up his residence. Although not a native of North Carolina, he had a strong predilection for that State, having often heard his father and grandfather speak of their visits to its early settlements. His official duties were very arduous. He was a member of the Governing Board of the Moravian Churches in North Carolina, a trustee of the Salem Female Academy, the administrator of the very large landed estates owned by the church in the State, and he frequently preached in Salem and other places. Yet he found time to continue his botanical researches, which he could now carry on in a dominion, scientifically speaking, all his own. On one of his exploring trips he discovered among the Sauraton Mountains, in Stokes County, a most beautiful waterfall, which still bears his name. Among his scientific correspondents at

this time were Dr. Reichenbach, of Dresden; Kunze, of Leipzig; Major Le Conte, United States Army; Blumenbach, of Göttingen; Elliott, of South Carolina; Schwaegrichen, of Leipzig; and Hooker, of England. The first fruit of his botanical work in the South was a synopsis of the fungi of North Carolina, written in Latin, which was given to the world in 1818 through the Society of Naturalists at Leipsic, under the editorial care of Dr. D. F. Schwaegrichen. Among the one thousand three hundred and seventy-three species described in this synopsis, there are three hundred and fifteen that were new to science. In the same year his duties required him to attend a synod of his religious brethren at Herrnhut. On his way he visited England, France, and Holland, and established correspondences which were of great value to him after he returned to America and began the formation of a regular herbarium. In 1821 von Schweinitz published at Raleigh, N. C., a pamphlet containing descriptions of seventy-six species of *Hepaticæ* (liverworts), among them being nine discovered by him. In the same year he contributed to the American Journal of Science, then in its fifth volume, a Monograph on the Genus *Viola*, in which five new species were described. This was a valuable paper, and was often cited by European botanists. In it he made the interesting statement that among the thirty species of violets then known in America there was not one exactly like any of the twenty European species.

During his residence at Salem, von Schweinitz had been offered the presidency of the University of North Carolina. The acceptance of this honorable position would have necessitated giving up his service in the Moravian Church, and so, feeling that the Brethren had the best claim upon his energies, he declined it. At the beginning of the year 1822 he removed to Pennsylvania, and took up his residence in his native village of Bethlehem. Here he undertook the charge of the Moravian girls' seminary at that place, and the secular office of general agent for the Brethren was retained. His botanical studies were not suffered to languish. "The beautiful slopes and valleys about Bethlehem and Nazareth," says Johnson, "the romantic banks of the Delaware, and the precipitous rocks of the Lehigh, all yielded up to him a tribute of their hitherto unexplored treasures. The high estimation set upon his works by men of science had procured his election as an honorary member in several societies devoted to natural history, both in Europe and America. His correspondence increased, and the formation of his herbarium advanced with great rapidity." About this time Major Long's expedition to the sources of the St. Peter's River, in the Northwest Territory, returned. It had been arranged that the plants collected on this trip by Thomas

Say should be described by Nuttall. The work was begun by this naturalist, but he was obliged to go to Europe, and was prevented from returning in season to do any more. The plants were accordingly put in the hands of von Schweinitz, who described them most acceptably.

Toward the end of 1823 the then well-known botanist communicated to the Lyceum of Natural History (now the Academy of Natural Sciences), of New York, a key or analytical table for determining the American species of *Carex*—the largest genus of the sedges. This production, though small in bulk, could result only from ample knowledge and exact discrimination. In 1824 the American Journal of Science published a short paper by him on the rarer plants of Easton, Pa. There was another synod at Herrnhut this year which it was necessary for him to attend, and, having a Monograph of the North American *Carices* about completed, he put the manuscript, together with a large collection of specimens, into the hands of Dr. Torrey, in order that the monograph might be communicated to the Lyceum of Natural History in his absence. He gave full liberty for making any additions or alterations warranted by Dr. Torrey's later discoveries. When he found, on returning, that his editor had made important additions to the number of species described, von Schweinitz, with characteristic conscientiousness, requested that the paper should be published as their joint production, saying that "the judicious and elaborate amendments he has proposed, and the mass of new and valuable matter he has added, entitle Dr. Torrey to a participation in the authorship of the work." The whole number of species described was one hundred and thirteen, of which six were new. This and the analytical table of the *Carices* were both printed in the first volume of the Annals of the Lyceum. In his absence a paper in which he described fifteen new American species of *Sphæriæ*, one of the largest genera of fungi, was communicated to the Academy of Natural Sciences of Philadelphia, and appeared in vol. v of its Journal.

Von Schweinitz was absent till near the end of 1825. After his return he resumed his labors as general agent for the Brethren; the charge of the school, however, had been given up some time before. The great work to which he now devoted his attention was a Synopsis of North American Fungi. He had intended this for publication in one of the European journals, but was induced to present it, in 1831, to the American Philosophical Society of Philadelphia. In this work three thousand and ninety-eight species, belonging to two hundred and forty-six genera, were described, of which twelve hundred and three species and seven genera had been discovered by the author. If to these discoveries we add those made by von Schweinitz in other orders of

plants, we have a total of nearly fourteen hundred new species added to botanic science by the talents and industry of a single observer. The whole number of species known at his death was estimated at sixty thousand.

Until he was about fifty years of age his health had been excellent. But the various and increasing cares of his official position finally had their effect. The sedentary work involved in writing a dissertation on the affairs of his community, which prevented for a time his usual out-of-door exercise, was the immediate cause of a severe cough and other alarming symptoms of decline. His spirits, which had been uniformly cheerful, became depressed. A journey to the West to establish a branch community of the United Brethren in Indiana was temporarily beneficial, but his system was undermined and the progress of disease could not be stayed. On February 8, 1834, came the end of what his memoirist calls "a life of various, constant, and unobtrusive usefulness."

A widow and four sons survived him. All the sons entered the Moravian ministry. The eldest, Emil Adolphus de Schweinitz, was born in Salem, N. C., in 1816. He filled various ecclesiastical offices in Pennsylvania and North Carolina, was made a bishop in 1874, and died in 1879. The second son, Robert, was born in Salem, in 1819. He has filled various charges and was for many years President of the Executive Board of the American Moravian Church. Since his retirement from the active ministry he has been general treasurer of the Church and of its Foreign Mission Department. The third son, Edmund Alexander, was born in Bethlehem in 1825, and died there in 1887. He also became a bishop, and was the author of several books on the history and polity of the *Unitas Fratrum*. In 1856 he established a weekly journal for the Moravians in America, which he edited for ten years. Bernard, the youngest son, was born at Bethlehem, in 1828, and died at the age of twenty-six years, being at the time in charge of a church on Staten Island. During the latter years of the father's life he used *de* in place of *von* in his name, and the sons have always used the new form.

Von Schweinitz was of high stature, erect carriage, and robust habit. The portrait accompanying this sketch is a copy of a miniature painted some years before his death, and consequently represents him in the prime of life. He had an unusually amiable and attractive disposition, which made him a general favorite with high and low. His conversational powers were of a high order, and contributed much to an ease of intercourse which was an important factor of his usefulness. Humor, anecdote, and repartee were always at his command, while the varied and exciting scenes through which he had passed and the prominent per-

sonages with whom he had come in contact furnished him an inexhaustible fund of interesting reminiscences. Strange to say, considering his German extraction, he was devoid of any appreciation for music. He spoke and wrote in English, German, French, and Latin, and was also acquainted with Greek.

A notable feature of his scientific work was its systematic character. Evidence of this is furnished by the synoptical tables attached to his several monographs, and by the fact that the analytical table of the *Carices* was one of his productions. The cryptogams had for him an attraction that they do not have for many. We owe most of our knowledge of this series of plants to German, Danish, and Swedish investigators. Knowledge that may not be read by him who runs but must be delved for, as is the case with that relating to the fungi and their near allies, seems to have an especial attraction for Northern minds.

Among his well-deserved honors was the naming after him of *Schweinitzia odorata* (sweet pinesap), by Stephen Elliott. This is a small plant, found from Maryland southward, and bears a spike of flesh-colored flowers which exhale the odor of violets.

A general characterization of the botanist's work can not be given better than in the following words of Walter R. Johnson:

"When we consider the extreme difficulty of the particular departments of botany to which Mr. Schweinitz devoted his chief attention, the prodigious number of facts which he has accumulated, the vast amount of minute and delicate investigation demanded by the nature of the objects of his study, the labor of preparing for the press the materials which he had brought together; when we recollect that, with the exception of Dr. Muhlenburg, of Lancaster, no American botanist had ventured far upon this wide and unexplored dominion of Nature, and when we remember that this science was his relaxation, not his profession—his occasional pursuit, not his daily duty—we are forcibly struck with the high order of his talents for the pursuit of physical science, and can not but regret that more of his time and energies could not have been devoted to this favorite occupation."

Von Schweinitz bequeathed his collection of plants to the Academy of Natural Sciences of Philadelphia. It comprised twenty-three thousand species of phanerogams and many thousand cryptogams. A large portion of the specimens were from the most remote parts of the world, having been obtained by exchange with American and European explorers. They included the "Baldwin collection" from Florida, Brazil, and La Plata, which von Schweinitz had bought, and in which he had found three thousand species not before in his herbarium. The examination and arrangement of these plants had been one of his last scientific labors.