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ART. I.—*Mémoires et Souvenirs de* AUGUSTIN-PYRAMUS DE CANDOLLE, *Ecrits par Lui-même et Publieés par Son Fils.* Geneva and Paris, 1862, pp. 599, 8vo.

DE CANDOLLE was born at Geneva on the fourth day of February, 1778; he commenced his distinguished career as a botanist in Paris in the later days of the French Republic; he continued it at Montpellier until 1816; when he returned to his native Geneva; where he died in September, 1841,—on the fifth day of that month, according the opening paragraph of his son's preface to this volume,—on the twenty-fifth according to the note by the same excellent authority at the close of the Memoir, p. 489. We cannot account for the discrepancy; but the former is without doubt the true date.

The twenty-one years which have elapsed since his death have thinned the ranks of those who knew DeCandolle, either personally or by correspondence. The *Théorie Élémentaire*, the *Organographie*, and the *Physiologie Végétale* have played their part, and have long ago passed out of general use. Yet, thanks to their influence, but more especially to the *Prodromus*, the name of DeCandolle is still perhaps the most prominent one with the cultivators of the science in general the world over,—is associated, not indeed with the profoundest depths, but with a larger amount of botany, than any other name except that of Linnæus. These are the personal memoirs of an industrious, highly useful, prosperous, and honored life. Begun at middle age, perhaps mainly for the writer's own satisfaction, or that of his family, and con-

tinued, at considerable intervals down to his last year, and evidently with a growing expectation of future publication,—they have appeared none too soon to secure the most interested, but rapidly narrowing circle of readers. The outer circle, however, is as wide as ever, embracing all the lovers of botany in our day, to none of whom can the name of DeCandolle be indifferent. The memoirs portray, not so much the botanist as the man. Indeed, the perusal was rather disappointing to us in the former regard. We expected to get fresh glimpses of his mind at work upon the problems of the time, and to watch the rise and development of the ideas which brought him fame. That could be had, however, only from letters, diaries, or other contemporary records: these are only reminiscences. On this account, too, and perhaps because the record was made with only a dim and distant view to publication, the narrative somehow has not all the vivacity and sprightliness, nor the ready flow of language, nor the affluence of anecdote, which those who personally knew the writer would have expected. There are, however, many favorable specimens of DeCandolle's powers of delineation, and some amusing anecdotes or interesting recollections of distinguished savans and others.

The family of *DeCandolle* (to retain the style of orthography which is kept up at Geneva, in which the *De* is written as a substantial part of the name) is an old and noble one in Provence; and a branch of it, reaching Naples in the thirteenth century in the suite of the Anjou princes, flourished there, under a name gradually changed from *Candola* to *Caldora*, down to the middle of the sixteenth century. *Augustin-Pyramus DeCandolle* derived one of his baptismal names from his ancestor, Pyramus de Candolle, who, becoming protestant, fled from Provence to Geneva in the year 1591, following an uncle who had already been established there for thirty or forty years. Augustin was the name of his father, in his earlier days a Genevan banker, a member of the state council, military syndic, and, about the time of the outbreak of the French Revolution, *Premier Syndic* of the little republic. Displaced by an earlier *coup d'etat* just as he was about to enter upon the duties of this office, he had retired into the country just in time to escape the worst perils of the woful imitation at Geneva of the reign of terror, in July, 1794, although he was condemned to death for contumacy, and his property in the city for a time sequestrated. The rest of his life was peaceful and long: he attained the age of 84 years, and died in 1820.

Augustin-Pyramus, the writer of this auto-biography, appears to have been remarkable in his boyhood rather for quickness of learning than for scholarship. His early tastes were for belles-lettres and poetry. Specimens of his poetical productions, both of his youth and of maturer years, are appended to the volume.

Of their merit we cannot pretend to judge. At the age of sixteen he happened to attend a few lectures of a short course on Botany, given by Vaucher,—who, living to a venerable age, survived his distinguished pupil. Here he learned the names of the parts of the flower, but nothing whatever of classification, having gone into the country for the summer before that portion of the course was reached. But his curiosity was awakened; and in his leisure hours he began to collect, observe, and even to describe the plants he met with in his rambles, at first without any botanical book whatever to guide him, and without any idea beyond that of amusement or relaxation. The next winter, returning to Geneva and to his college studies, he came to know Saussure, then in his last years and half paralytic. The veteran physicist, while he endeavored to attract the young man to scientific pursuits, discouraged his predilection for botany. That he regarded as quite unworthy of serious attention. Another summer passed upon the side of the Jura, however, and the perusal of Duhamel's *Physique des Arbres*, of the Researches upon Leaves of the pastor Bonnet (a friend of his father), also of Hale's Vegetable Statics, which he painfully translated from the English, and finally the acquisition of the *Linné de l'Europe* of Gilibert—in which the Linnæan artificial classification even then annoyed him by its incongruity with the natural relationships which he already recognized,—these had by this time fixed his fate before he was at all aware of it; and perhaps had even determined in some sort his characteristics as a botanist.

An unexpected opportunity to pass the ensuing winter in Paris opened the way. This occurred through an invitation from Dolomieu, who, while young DeCandolle was herborizing in the Jura, had been mineralogizing in the Alps, attended by two of DeCandolle's school-mates, Picot and Pictet. In the autumn of 1796 the three young men proceeded to Paris, under the auspices of Dolomieu, who secured for DeCandolle a lodging immediately over his own apartments, and presented him to Desfontaines and Deleuze at the *Jardin des Plantes*. No botanical lectures were given at that season of the year; but DeCandolle attended the principal scientific courses then in progress; among them those of Fourcroy and Vauquelin upon Chemistry, of Portal and Cuvier upon anatomy, and of Hauy upon mineralogy. It was at this early period that his acquaintance and life-long intimacy with the excellent Delessert family commenced. By a rather ingenious device he contrived to make the acquaintance of Lamarck, but he gained little thereby in the way of botany, Lamarck being just then wholly occupied with the discussion of chemical theories. When DeCandolle returned to Geneva in the spring of 1797, Lamarck sent by his hands a volume to Senebier, and so he came to know his amiable countryman, who,

in ascertaining the capital fact that plants decompose carbonic acid, may be said to have laid the foundation of modern vegetable physiology. The first genus which DeCandolle established (in 1799) was *Senebiera.*

From his narrative it would appear that, during this summer of 1797, the ambitious young botanist of two years' standing, and only 18 years old, had not only conceived the idea of writing an elementary work, but actually traced the plan and wrote some chapters of it! He even states that from this period date the first observations and the conceptions—confused indeed, but correct—of the part which the abortion and the union of organs play in floral structure,—namely, the ideas which principally distinguish the *Théorie Élémentaire,* published fifteen years later. How far these ideas were developed, however, we have no means of ascertaining. One would like to see an extract from this early manuscript, in confirmation.

The following winter he began to study law at Geneva. But with the little State now annexed to the great French Republic, the prospects were not encouraging. A career must be sought elsewhere. DeCandolle determined to study medicine, at the same time prosecuting his botanical studies, so as to have a double chance, by falling back upon the former in case the latter failed to support him.

In this view, he returned to Paris in the spring of 1798, just in time to see his patron Dolomieu set out for Egypt, as one of the savans of that famous expedition, and to decline a pressing invitation to accompany him. Taking a lodging in the *Rue Copeau,* to be near the *Jardin des plantes,* he attended the hospitals and medical lectures, which he disliked, but recompensed himself at the Garden of Plants with the courses of Lacépède, Lamarck, Cuvier, and Hauy, omitting the botanical lectures, as not to his mind, but sedulously examining the plants of the Garden. He renewed his acquaintance with Lamarck, at whose request he wrote a few articles (under the letter P) for the *Dictionaire Encyclopedique.* Lamarck himself by this time had quite abandoned Botany.

It was to Desfontaines that DeCandolle was indebted for an immediate opportunity of beginning his botanical career. It came about thus: L'Heritier, who appears to have been wealthy, had engaged Redouté, the celebrated flower-painter, to prepare drawings of all the fleshy plants in cultivation, it being impossible well to preserve them in the herbarium. The artist undertaking to publish these drawings, applied to Desfontaines for a botanist to furnish the descriptive letter-press. The kind Desfontaines recommended DeCandolle, and moreover offered to direct him in the work. He freely opened to the young botanist his herbarium and library, and allowed him to study by his

side; indeed Desfontaines was his botanical master and fatherly friend. The botanical library of L'Heritier, then much the largest at Paris, was naturally at his service, until the death by assassination, soon afterwards, of its singular owner. DeCandolle, thus connecting his name and studies with the work of the unrivalled flower-painter, acquired thereby, as he remarks, more reputation than he deserved, and more instruction than he expected.

In the course of this same summer, of 1798, an invitation from Alexander Brongniart, the mineralogist, (whom DeCandolle had slightly known, through Dolomieu, on his first visit to Paris,) connected him with a small party of naturalists who made an excursion to Fontainbleau. Besides Dejean, the entomologist, then very young, Cuvier and Dumeril were of the party. In the autumn of the same year he visited Normandy, with less celebrated companions, and formed his first acquaintance with marine vegetation. The next year he made a visit to Holland, to consult the gardens and conservatories of that country, the richest in the *plantes grasses*, which then occupied his attention. One result of this journey was that he induced his friend Benjamin Delessert to purchase Burmann's herbarium, and thus to lay the foundation of the important collections and library at the Hotel Delessert which have been so useful to naturalists, and so liberally devoted to their service. During the winter of the following year DeCandolle elaborated the *Astragalogia*, his first independent work of any considerable consequence, and which was published two years later: in this he found opportunity to dedicate to his friend Delessert the Leguminous genus *Lessertia*.

About this time, namely, at the beginning of the century, he became acquainted with Mirbel, who had come up to Paris from the south of France, where he had been a pupil of Ramond. Instead of translating DeCandolle's remarks, we may as well give them in the original.

"Il [Mirbel] savait alors peu de botanique, mais il annonçait de l'esprit et des talents. Je me liai avec lui. Il venait souvent déjeuner chez moi. Nous causions botanique; j'avais deux ou trois ans d'avance sur lui, et j'étais naturellement communicatif; je lui fis parts de plusieurs idées, nouvelles pour lui, et dont quelques-unes l'étaient pour le science. Elles parurent l'interresser, car j'en retrouvai une grande partie dans les éléments de physiologie qu'il publia peu d'années après; telles sont la distinction des feuilles séminales et primordiales, l'importance de l'étude des nervures principales des feuilles, etc. Appelé à rendre un compte succinct de cette ouvrage dans le *Bulletin philomathique*, je me divertis à ne citer que les idées que j'avais suggérées à l'auteur; je n'en revindiquai aucune, et ne sais pas même s'il s'est aperçu de cette petite malice. Je dois dire que je ne prétendis point, même alors, que se fût un plagiat volontaire, mais il arrive souvent dans les sciences qu'on s'appropie, sans s'en douter, ce qu'on a entendu dire.

"Cette circonstance éveilla ma propre attention sur la justice rigour-

euse que j'ai désiré rendre a tous: la force de ma mémoire, et surtout le soin que j'ai eu très-jeune de noter les faits et les idées nouvelles que j'entendais dans la conversation, m'ont mis à même de pouvoir, bien des années après une conversation, citer exactement celui de qui j'avais appris un fait ou une opionion quelconque. Cette habitude de justice m'a fait beaucoup d'amis, et j'ai eu souvent des remerciements de gens cités par moi, qui eux-mêmes avaient oublié ce qu'ils m'avaient dit." (p. 91, 92.)

To DeCandolle's credit it must be said, not only that his career was remarkably free from controversies about priority and reclamations, but that his example and precepts, his scrupulous care to render due credit to every contributor, his respect for unpublished names communicated to his own or recorded in other herbaria, and the like, have been most influential in establishing both the law and the ethics which prevail in systematic botany (more fully, or from an earlier period than in the other departments of natural history), and which have secured such general coöperation and harmonious relations among its votaries.

In these early days DeCandolle was a good deal occupied with vegetable physiology;—the results are contained in his papers "on the pores in the bark of leaves," i. e. stomata; on the vegetation of the mistletoe; and on his experiments relative to the influence of light on certain plants, mainly those which exhibit strikingly the change in the position of their leaves at night which has been called the sleep of plants. The account of these experiments, in which he caused certain plants to acknowledge an artificial night and day, when read before the Institute, gave him considerable eclat,—and probably also the compliment of being named one of the three candidates to fill the vacancy in the Academy of Sciences left by the death of L'Heritier. A mere compliment, for the contest, of course, was between Labillardière and Beauvois. In the canvass DeCandolle called upon Adanson, then very aged, and in his dotage more excentric than ever.

If not chosen into the Institute, which indeed he could not pretend to expect, DeCandolle was in that year made a member of that active association,—la pépinière de l'Academie des Sciences,—the *Société Philomathique*, and was soon placed on the committee in charge of its *Bulletin*. This brought him into intimate connection with such colleagues as Brongniart (Alex.), Duméril, Cuvier, Biot, Lacroix, and Sylvestre.

"We met, at each others lodgings, on Saturday evenings, after the session of the society, to read and to discuss the *morceaux* intended for the Bulletin, and when our labor was finished we took tea together and chatted familiarly. As one by one we exchanged the celibate for the married state, our wives were introduced;—then we no longer read our extracts, and at length we gave over making the Bulletin, but we kept up our Saturday evening reunions. It was in consequence of this that Cuvier continued long afterwards his Saturday evening receptions; but I return to the year 1800."

By DeCandolle's account he was by about ten years the youngest member of this *réunion*. Yet he has the name of Biot and Duméril on his list, both of whom survived him for twenty years: and Biot was really not quite four years his senior, and Duméril only five.

As a member of this select circle of intimate friends and zealous *savants*, all then pressing on to the very highest distinction, we may well believe that the ambitious young botanist enjoyed, and improved to the full, such golden opportunities, that he learned something of every branch of natural history, and also —what was no less useful at Paris—"à connaître les hommes et les mobiles cachés de bien des choses."

DeCandolle sketches the following portraits of three of his associates, Duméril, Cuvier, and Lacroix. And first of

"The excellent Duméril. He was the ideal of the frank character which we attribute to the Picards. He was a sincere and devoted friend, always ready to second and render any service to me and mine. No cloud ever threw a shadow over our alliance, which became closer yet when, at a later period, the friendly connexion of my wife with the widowed Madame Say determined the latter to marry Duméril. He was chief demonstrator in the anatomical department at the School of Medicine, but he became professor and member of the Academy of Sciences. Duméril was remarkable rather for the clearness of his ideas, and the variety and accuracy of his knowledge in natural history, than for theoretical principles. He was a practical man, whose elementary works had considerable success, but who, after having had a glimpse of some of the laws of organic symmetry, such as the analogy of the skull to vertebræ, seemed to have collapsed before their immensity. His principal services to science were in the way of teaching, and in the encouragement which he so well knew how to give to the young. The heart in this kind of influence is more essential than the head, and although Duméril's judgment was clear and quick, he was much more remarkable for his moral qualities.

"Cuvier, who was from the beginning the intimate friend of Duméril, was entirely different: and it would be difficult to find two people who were less analogous. Born at Montbéliard and brought up at Stuttgard, Cuvier had something of the gravity and even of the obstinacy of the German. Placed for sometime in an inferior position, he was forced from his youth to make up for it by the dignity of his manner, but the world of *savans*, at least, will never forget his sojourn in Normandy, where he made those beautiful investigations on the molluscs which were the beginning of his fame. Called afterwards to the *Jardin des plantes* as assistant to the aged Mertrud, he owed this position to the friendship of Geoffroy; but he soon surpassed his patron. In consequence of this position he was a member of the Institute from its foundation, and quickly acquired the reputation which results from great talent united to a skillful ambition. At the time when the office of secretary was annual he foresaw it would become perpetual, and arranged in such a manner as to fill one secretaryship almost continually, either himself or by others; so

that he found himself in position to have it without contest when it became permanent and well paid. These first steps being taken, all places fell to him as of themselves, and we saw him successively Professor of the École centrales, of the Collége de France, at the Jardin des Plantes, Inspector, then Councillor, then Chancellor of the University, Councillor of State, Baron, Peer of France, &c. &c. His talent, his aptitude for knowing and doing everything, made him skillful in every function; he brought to it method, order, facility for administration, a knowledge of details and of the whole, a sincere love of justice, and a disinterestedness which caused him to be noticed and admired.

Cuvier might justly be compared to Haller, whom he resembled as much as the difference of nation and time would allow. Both astonished by their extraordinary capacity for learning, knowing equally well natural and historical science, greedy of positive facts on all subjects, endowed with wonderful memory and a remarkable spirit of order, capable of great labor, and yet gifted with much facility. But at the side of these admirable qualities it might be observed that neither had an inventive genius; they observed facts well, but never thought to unite them by a theory that would divine or discover others. Their characters corresponded even outside of science: both loved power, and sacrificed precious time to the desire of political advancement; both loved reading to a passion, even at the hours destined ordinarily for meals and domestic intercourse; both were cold and haughty in conversation with those who inspired them with no interest, *piquante* and profound to those whom they thought worthy of it; finally both had a certain contempt for that class of ideas called liberal, and held to the aristocratic party. The great size of their heads gave them a certain physical resemblance. In one word, it would be difficult to find two celebrated men more exactly alike, and the lovers of metempsychosis might say, if the epochs would permit, that the soul of Haller had passed without change into the body of Cuvier.

"To me, personally, Cuvier was well-nigh perfection. . . . . . . Notwithstanding the great difference in our respective views of life and of politics, and even of science in some theoretical matters, our intimacy was never clouded, nor was it disturbed by his quarrel with Geoffroy, although he knew that my opinions inclined towards those of the latter.

"The geometrician Lacroix was a genuine specimen of the philosopher of the eighteenth century, a republican of the school of Condorcet, an enemy to the great and their hangers-on, uniting the gaiety of a child with the moroseness of a disappointed old man,—the ease, grace, and kindness of a warm-hearted gentleman with the gruffness of a grumbler. He was a thoroughly excellent man, but a stranger to the life of the world around him. The character of the misanthrope in Molière, which I supposed purely imaginary, I found completely realized when I knew Lacroix."

An episode of fifteen days, during which DeCandolle, to his great surprise, had political functions to perform,—being appointed one of the three notables of the department of the Léman, in a representation of all the departments of the French Republic, which the First Consul called together,—gives us the first glimpse of Bonaparte in this narrative; and DeCandolle's

account of the interviews with him, and with his minister of police, Fouché, is well worth preserving. With this transient exception, we have only the most incidental allusions to public affairs during the eventful years of the Consulate, the Empire, and the Restoration.

We pass by, also, the interesting account which DeCandolle gives of the doings of Delessert and himself, in the establishment and administration of the Philanthropic Society, which grew out of the introduction by them of Count Rumford's economical soups, distributed to the poor. These honorable undertakings brought the two friends into relations with Rumford himself when he came to reside at Paris. Indeed Delessert, as we have had occasion to learn, became one of Count Rumford's executors. The admiration with which Rumford's writings and economical inventions had inspired the two young philanthropists was much diminished upon personal acquaintance.

"It was after his plans," writes DeCandolle, "that we had constructed our furnaces, after his receipts that we made our soups, upon his advice that we were induced to substitute such assistance for gifts of money."

So when Rumford was expected at Paris, they congratulated themselves upon such an acquisition, went to meet him on his arrival, and brought him to dine with them.

"We found him a dry, methodical man, who spoke of benevolence as a discipline, and of the poor as we should not have dared to speak of vagabonds. It is necessary, said he, to punish those who give alms; the poor must be forced to work, &c., &c. Great was our astonishment at hearing such maxims: however we did our utmost to profit by his advice in practical matters. I had a good deal of intercourse with him, one among others odd enough. Mdlle. Rath, a Genevese painter, and like ourselves enthusiastic about Rumford, wished to paint his portrait to be engraved. M. Jay, her relation and my friend, then director of the *Décade Philosophique*, wished to put it into his journal, and asked me for a notice of M. Rumford to accompany it. Knowing little of his former life, I asked M. Rumford himself for a few notes: he promised them, and appointed an interview at his house to give them to me: I went: what was my astonishment when he presented an article entirely complete and quite eulogistic. That was not all; he required me to copy it on the spot, not wishing to leave the manuscript in his writing in my hands. I thought the proceeding rather indelicate, and the distrust not very polite. I deferred however to the wishes of a man for whom I had always had until then the highest respect; I obeyed: I transmitted to the *Décade* the written article, with small additions, and I have never mentioned until after the death of Rumford, not even until now, the secret of its origin, thinking that this trait would not raise him in estimation.

"M. Rumford settled in Paris, where he afterwards married Mdme. Lavoisier, the widow of the celebrated chemist. I saw something of both, and I never knew an odder union. M. Rumford was cold, imperturbable,

obstinate, egotistical, prodigiously occupied with the material part of life, and in inventions in the smallest matters. He was engrossed with chimnies, lamps, coffee-pots, and windows made after a peculiar fashion; and he contradicted his wife twenty times a day about the management of her housekeeping. Mdme. Lavoisier-Rumford ..... was a woman of very decided character. A widow for twelve or fifteen years, she had been in the habit of having her own way, and did not like to be contradicted. Her mind was broad, her will strong, her character masculine. She was capable of lasting friendship, and I could always congratulate myself on her kindness to me. Her second marriage was soon disturbed by grotesque scenes. Separation was better for both than union. He got a pension, which he needed, but which death prevented his long enjoying. She obtained liberty and the title of Countess: both were satisfied. He could now arrange the house at Auteuil as he liked: she continued to receive a select circle at hers."

Of this racy and unflattering sketch, we have only to remark that, however it may have been as to the pension, Rumford's pecuniary means, as shown by his endowments and legacies in this country, were more considerable than DeCandolle supposed.

Appropos to reminiscences of distinguished *savants*, we look forward a year or two in the narrative, and select the following. And first, of a person who was well known to a past generation, and to some who still survive, at Philadelphia.

"Joseph Correa de Serra was then about fifty-five or sixty years old. He was of an ancient family in Portugal, which had produced several literary men. After studying at the University of Coimbra he was transferred to Rome, where he pursued theological studies for a dozen years at the College of the Sapienza, but which he left with a knowledge of many things beside theology. Returning to Portugal, he was made governor to the hereditary Prince, Secretary to the Academy of Sciences, &c., and became a very influential person, both on account of his talents and on account of the position of his pupil, who it was supposed would become king on attaining his majority, as his mother was only regent. Correa was made Minister; and his first act was to overthrow the Inquisition. But the Prince died just as he was coming of age, and Correa was left exposed to the hatred and jealousy of the priests. After a while he obtained permission to go to England, where he lived in the society of the *savants* of which Sir Joseph Banks' house was the centre. Afterwards he removed to Paris, where he also lived among *savants* and men of letters, and where he showed the most noble character when the siezure of Portugal by Bonaparte deprived him of all his resources. He possessed the singular faculty of knowing every thing apparently without labor. It is only the people of the south who can thus combine great facility with profound idleness. The latter prevented his publishing anything beyond small dissertations, quite below his talents; but in conversation all his various knowledge and his ingenious views were charmingly exhibited. In these days Humboldt and Cuvier often came to my lodgings, where they occasionally met Correa. Although their celebrity was far above his, and justly so, on account of their published works, yet Correa always got the advantage over them; and it was by no means the least

of the enjoyments of our sociable little dinners to see the sort of deference, and even fear, which Cuvier and Humboldt exhibited in the announcement of their opinions before Correa, who, with the grace and sly maliciousness of a cat, would at once expose their weak sides. Like them, he was familiar with all the historical and natural sciences, and he used his vast stores of knowledge with a severe logic and rare sagacity. He spent many hours in my herbarium; where the subtle perspicacity which he brought to bear at a glance upon plants, often wholly new to him, taught me much of the art of observing, and especially of combining observations in botany. To such talents he joined a lofty soul and a heart devoted to friendship. It was a great grief to me when, at over sixty years of age, he quitted Europe to rejoin in Brazil the king who had persecuted him; but he forgot all his wrongs when his sovereign became unfortunate. Correa died when ambassador to the United States."

The following, of a somewhat later period, is abridged from DeCandolle's account of the *Société d'Arcueil*:—

"Its founder was the excellent and illustrious Berthollet, who then living in his country residence at Arcueil, ... invited thither, once a month, a few young *savants*, by way of encouraging their efforts. His colleagues MM. de la Place and Chaptal, also senators and members of the Institute, were, so to say, Vice Presidents of this little reunion. Humboldt also had a place, and the *parterre* was composed of Biot, Thénard, Gay-Lussac, Descotils, Malus, Amédée Berthollet, and myself. Later, Berard and François de la Roche were admitted. [And finally Arago, Poisson, and Dulong, adds the editor, who notes that the last volume of the *Mémoires d'Arcueil* was published in 1817.] The association was devoted to the physical and chemical sciences. I was admitted in view of the applications of vegetable physiology to chemistry; and I contributed some articles upon this subject to the *Mémoires d'Arcueil*, namely, my Note on the cause of the direction of stems towards the light, my Memoir on the influence of absolute height upon vegetation and upon the geographical or topographical distribution of plants, and, later, one upon double flowers, especially of the *Ranunculaceæ*. The first of these writings was a simple and clear solution [although an incorrect one, as it proves.—Eds.] of a problem which was deemed insoluble; the second reduced to just proportions the exaggerations of Humboldt upon the influence of elevation; the third was an essay connected with the observations of the degenerescence of organs, to which my *Théorie Elementaire* was devoted. . . . . .

"We commonly made our *rendezvous* at Thénard's, and went together to Arcueil, as happy with this run into the country as school-boys out for a holiday. We walked about in this pleasant villa, and relished the society of our leaders. Nothing can fully describe the good-nature and simplicity of M. Berthollet and even of Madame. They were with us as parents with their children, and we made ourselves at home in the house with perfect *abandon*. M. Berthollet was quite fat and very full-blooded. He feared heat so much that he wore clothes only out of respect to society, and at night he slept entirely uncovered upon his bed. 'What,' said we, 'even in winter?' 'Oh,' he answered, 'when it is very cold I spread my pocket-handkerchief over my feet.' This man, so high in social rank and scientific celebrity, bore contradiction unusually well, and loved above all things truth. When the first works of Berzelius

upon definite proportions became known at Paris, I was very much taken with them, and although they were in direct opposition to the principles of statical chemistry he sustained, I did not fear to tell M. Berthollet the high opinion I had of them. Far from taking offense at this preference, he encouraged me to study the writings of Berzelius.

"M. de la Place was of quite a different character. He had the dryness of a geometrician and the haughtiness of a *parvenu*. Over and above these defects of manner, he was a man of honor and worth. . . . . He often seconded me, although in truth he thought very little of natural history. In our meetings he often had little quarrels with M. Berthollet, and would think to silence him by saying: 'But you see, M. Berthollet, what I say to you is mathematics.' 'Eh, par Dieu, what I say to you is physics,' answered the other, 'and that is quite as good.' . . . . Humboldt also came from time to time; but he added much of life and interest when he appeared. He affected to pass himself as the creator of the science of Botanical Geography,—to which he has only added certain facts, and the exaggeration of a true theory so as to render it almost false. He never quite pardoned me for having, in the preface to my memoir on the geography of the plants of France, cited those who before him had occupied themselves with geographical botany,—although in this exposition I had, in truth, much amplified his share.

"Among the other members of the society of whom I have not yet spoken, I would chiefly mention Thénard, who was then commencing a career which has since become very brilliant. His activity, his ardor, and his uprightness pleased me very much. . . . I could draw, in an anecdote, the contrast between the characters of Thénard aud Descotils. . . . . It was then very difficult to correspond with England, on account of the continental blockade. I happened to be the first to receive, by a letter from Dr. Marcet, the news of Davy's great discovery in decomposing the fixed alkalies. By a happy chance, it reached me on the morning of the day of our meeting. I hastened to our usual rendezvous, and could not wait for the session to impart so important a discovery. I read my letter to the members present. Thénard was enthusiastic; he ran about the room like a mad-man, crying out: 'it is beautiful, it is admirable!' Then turning to me, and laying hold of his arm: 'Look here,' said he, 'I would give this arm to have made this discovery.' Descotils, tranquilly buried in an arm-chair, said also, but in quite another tone: 'It is very fine; but I would not give the end of my little finger to have made it.'"

We pass over all DeCandolle's account of his life and domestic affairs during his residence at Paris, his particular investigations, his excursions, in Switzerland and elsewhere,—even the memorable one in the Jura with Biot and Bonpland, in which he led the party into a position of imminent danger, causing Bonpland to bemoan his hard fate in having to perish on such a mole-hill as the Jura, after having safely climbed Chimborazo (p. 154);—his engagement and marriage (the latter in April, 1802) with Mlle. Torras, of a Genevan family resident in Paris; of the foundation of his herbarium by the fortunate acquisition of that of L'Heritier;—of the first course of lectures which he gave, at

the *Collége de France*, as a substitute for Cuvier, during the temporary absence of the latter, giving a course of vegetable physiology in place of one on general natural history;—how he prepared to take the degree of M.D. in order to qualify himself as a candidate for the chair of medical natural history at the School of Medicine, then vacant; but how Richard, who disliked him because he was a pupil of Desfontaines, as DeCandolle says, instigated Jussieu to offer himself for this chair, upon which of course DeCandolle withdrew, but nevertheless wrote and sustained as a thesis for the doctorate, his Essay on the Medical Properties of Plants, compared with their exterior forms and their natural classification. He bore his examination creditably, received his diploma, and, the same evening, a private mock inauguration, which, considering the parties engaged in it, must have been irresistably comical.

"Duméril invited to his house my family, my comrades of the *Bulletin Philomathique*, and even some of the Professors of the *Ecole de Medicine.* This grave assembly amused themselves in giving me the reception, in full dress, from the *Malade imaginaire.* It was a curious sight to see Cuvier, Lacroix, Biot, and other learned Academicians rehearsing the scene from Molière in the costumes of the Comédie Française. They had smothered me in an immense sugar-loaf paper cap ornamented all over with little lamps all alight. In the motion of bowing I constantly expected to be set on fire. But the acolyte who conducted me would then press a sponge well filled with water borne on the top of the cap, and the water ran down, not upon the lamps, but upon my head,—the audience laughing uproariously at my surprise."

Let us pass on to more serious matters, and rapidly sketch the outlines of the scientific career now fairly and promisingly opening. For the event which fixed DeCandolle in his true field of labor was his arrangement (in 1802) with Lamarck—who had long since abandoned botany—to prepare a new edition of the *Flore Française.* The arrangement was a favorable one to De Candolle, both financially and scientifically. The new edition was of course an entirely new work, one particularly adapted to DeCandolle's genius, and which gave him at once a wide reputation. Indirectly this work gave origin to the botanical explorations of the provinces of France, under the auspices of the Government, which engaged much of DeCandolle's attention from the summer of 1806 until he ceased to be a French subject.

And now, the death of old Adanson left a vacancy in the botanical section of the Institute, which DeCandolle might hope to fill. But parties and personal dislikes, as it appears, were not unknown nor uninfluential in the Paris of half a century ago. Indeed DeCandolle (let us hope without sufficient grounds) roundly charges lamentable weakness to Lamarck, and less creditable motives to Fourcroy and even to Jussieu, in respect to the nomination and canvass; while of the Abbé Hauy he relates, to

his credit, that, upon being approached with the suggestion that his conscience should prevent his voting for a Protestant, he replied that he was very glad of an opportunity to show that he never mixed up religious opinions with scientific judgments. Palisot de Beauvois, the rival candidate, was elected, in spite of the hearty support DeCandolle received from his comrades of the *Bulletin Philomathique* and his eminent associates of the *Société d'Arcueil*, Berthollet, Chaptal, LaPlace, Cuvier, &c.,—to say nothing of his scientific superiority over his rival, which DeCandolle naturally regarded as very great. At that time, according to DeCandolle, Beauvois had produced, "ni la *Flore d'Oware*, ni le *Prodrome de l'Ethéogamie*, ni en un mot aucun de ses ouvrages qui," etc. But in this DeCandolle's memory was perhaps at fault: for, while this election took place in the autumn of 1806, the latter of these works of Beauvois, according to Pritzel, was published in 1805, and the first volume of the former in 1804.

Evidently the disappointment was keenly felt. Membership in the Institute secured not only an assured position but also a comfortable little annuity. This, and the prospective needs of an increasing family disposed DeCandolle to look elsewhere, and to accept, after some hesitation, the botanical chair at the University of Montpellier, which in 1807 became vacant by the death of Broussonet. Hardly was he established there when the death of Ventenat, in the autumn of 1808, made him again a candidate for a seat in the Institute;—again an unsuccessful one, but now chiefly because a considerable number of his particular friends in the Institute required a promise that if chosen he would reside at Paris, which he could not with propriety give. So they voted for Mirbel;—and DeCandolle took root at Montpellier, where he flourished from 1808 to the year 1816.

That DeCandolle, full of ambition and with a good opinion of his abilities, should have disliked to give up Paris is natural; but he himself afterwards records the opinion (which we share) that his removal from the metropolis was the best thing for him, as enabling him to accomplish more for botany. And as to the honors of the Institute, his disappointments were more than made up to him in the sequel by his election as one of the eight foreign associates of the Academy of Sciences.

At Montpellier, DeCandolle was heartily welcomed by his colleagues, by the official personages and by the protestant society of the city,—in those days there was little social intercourse between catholics and protestants in the south of France,—and he gave himself with ardor and success to his new duties. He renovated the botanic garden,—the oldest in France, founded by Henry IV,—and secured additional funds for its support. He built up the botanical school, and developed peculiar talents as an instructor,—with results perhaps up to the average as

respects the making of botanists; but Dunal, one of his earliest pupils, was about the only one at Montpellier who achieved a general reputation, and his fell much below expectations. He continued and extended his official botanical explorations of the provinces of France, making annual reports to the Minister of the Interior, and planning a very comprehensive work on the *Statique Végétale de la France*, which, however, owing to political and other changes, was never written. He wrote and published the *Théorie Élémentaire*, which made his reputation as a theoretical botanist, and well exemplifies the characteristics of his genius in this regard,—constructive rather than critical,—quick and ingenious in seizing analogies and in framing hypotheses, rather than sagacious in testing their validity,—content with an hypothesis which neatly connects observed facts, but not so solicitous to prove it actually true, nor urgent to follow it out to ultimate conclusions,—a lucid expositor, and a happy diviner within a certain reach, rather than a profound investigator,—in short, a generalizer rather than an analyzer.[1]

At Montpellier, also, DeCandolle planned his *Systema Vegetabilium*,—a systematic and detailed account of all known plants, arranged under their natural families,—and he there prepared the first volume of this work; thus, with characteristic ardor and courage, but without calculating its immensity, entering upon the grand and most important undertaking of his life, and into that field of labor in systematic and descriptive botany for which he was eminently adapted, by his enterprising disposition and unflagging industry, his capacity for sustained labor, his excellent memory, his spirit of order and method, his quickness of eye, and his great aptitude for generalization.

The overthrow of the Empire, the Restoration, the Hundred Days, and the final fall of Napoleon supervened. DeCandolle's life at Montpellier was troubled and his prospects precarious. He naturally turned to his native Geneva, where he had kept up intimate social relations; and when he had ascertained that a place would be provided for him, he exchanged the comparatively ample emoluments of the chair at Montpellier, for the very humble salary of one at Geneva, encumbered with the duty of lecturing upon zoology as well as botany.

Pending the change he made a visit to England, in 1816, of which a detailed account is given, with reminiscences of the botanists and others whose personal acquaintance he then made. We regret that we have no room left for further extracts: his account

[1] It is curious that DeCandolle, who early took to the ideas of Geoffroy in anatomy, who founded his morphology of the flower upon the idea of symmetry, and recognized the homology of the floral organs with leaves, and who could have got from the writings of his townsman, Bonnet, enough of phyllotaxy for the purpose, seems never to have thought of connecting the one with the other, nor to have asked himself *why a flower is symmetrical.*

of Brown is expressive of the great respect he entertained for him, and that of Salisbury and of Lambert is amusing.

Settled now at Geneva, at the good working age of 38, the narrative of his steadily industrious and prosperous life, and of his happy surroundings, flows on for nearly 200 pages, down to the sad overthrow of his health by an overdose of iodine in 1836, his partial convalescence and resumption of botanical work in 1837, and ends with the record of the death of his only brother, at the beginning of the year 1841, only eight months before his own.

These 25 years witnessed the publication of the two volumes of the *Systema;* the change of plan to a *Species Plantarum* in a restricted form, more nearly within the limits of a mortal's life and powers; the publication of the *Organographie* and of the *Physiologie Végétale*, and,—not to mention a hundred other botanical and sundry miscellaneous writings, of greater or smaller extent,—of seven out of the present fifteen volumes of the *Prodromus.* Only one botanist of the present century,—and one happily who still survives,—has accomplished an equal amount of work, and good work, in systematic botany.

Our account has run on to such a length that we cannot touch upon DeCandolle's social and domestic life—of which the memoirs reveal pleasant glimpses, nor of his useful and honorable life as a Genevan and Swiss citizen. Nor can we now venture to gather interesting anecdotes from his notices of friends, visitors, pupils,[2] and collaborators; nor notice his methods of working, and his capital arrangements for securing and classifying details and economizing time.

It is not for us to pronounce upon DeCandolle's relative rank in the hierarchy of naturalists. He incidentally once speaks of Brown and himself as rivals for the botanical sceptre. It is natural that they should be compared, or rather contrasted; for they were the compliments of each other in almost every respect. The fusion of the two would have made a perfect botanist. But DeCandolle's facility for generalization, zeal and industry were as much above, as his depth of insight and analytical power were below Brown's. The one longed, the other loathed, to bring forth all he knew. The editor compares DeCandolle's traits of character with those of Linnæus, as delineated by Fabricius, and finds much resemblance. But his impress upon the science, however broad and good, can hardly be compared with that of Linnæus.

A. G.

[2] In his note about Berlandier, (p. 337, 338) the editor has fallen into a mistake in respect to his collections, acquired of his widow by Lieut. (now General) Couch and sent on to Washingtom. The botanical collection was purchased for distribution by Dr. Short of Kentucky, and the sets of specimens (which were poorly preserved, indeed, but yet very important) were most liberally presented by him to those botanists to whom it was thought they would be most useful.