



ALFRED VICTOR DU PONT  
*Head of E. I. du Pont de Nemours and Co., 1837-1850.*

# THE EDUCATION OF ALFRED VICTOR DU PONT, NINETEENTH CENTURY INDUSTRIALIST

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## INTRODUCTION

**B**IG business, and the men who have created the large corporations—the Great Organizers, as Ernest Dale has named them—have been the subjects of considerable historical investigation in recent years.<sup>1</sup> The industrial corporation, as an institution in our economy responsible for more than 90 per cent of all goods produced, and one that provides employment for over 90 per cent of all people engaged in manufacturing occupations, arrests the attention of both historian and economist.<sup>2</sup> Research, as we know, has centered upon the post-Civil War businessmen, the iron and steel “barons,” the railway “kings,” the utility tycoons, automobile manufacturers, oil company executives, and sundry others who shaped the era of big business and energized the age of consolidation.

Much less attention has been given to an earlier generation of industrialists, those of the first decades of the nineteenth century when the Industrial Revolution was taking root in this country, and the attributes they brought to bear on the businesses they directed.

Here we would like to sketch a brief account of one of these

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<sup>1</sup> Ernest Dale, *The Great Organizers* (New York, 1960).

<sup>2</sup> Adolf A. Berle, Jr., and Gardiner C. Means, *The Modern Corporation and Private Property* (New York, 1948, reprint), 14.

early firms when it was a small enterprise managed by one family, some forty or more years before the Civil War. Our principal concern, however, is not a history of the company, but as close a scrutiny as we can obtain of the education and training received by the son of the founder of the firm. If his preparation was typical of that received by the young men who moved into responsible positions in America's first manufacturing establishments, then we shall possibly obtain a better understanding of the proprietor-manager class that directed our pre-Civil War industries. We shall also learn a little of the role of institutions of higher learning in training young men in physics, mineralogy, and chemistry—sciences that were becoming increasingly important as industrial technology grew more complex.

## I

The decision had proven a wise one. So the father sat down one day and wrote these words to his closest friend back in the homeland:

Perhaps you may remember my comparison of the world to a piece of cheese; in your place I should not hesitate to put one of my eggs on the fresh new side where we live rather than keep them all on the rotten side that is called Europe. Pline, with his education and under our wings, would do well here. If before you send him to us, you have him study science—chemistry and mechanics, it would be very helpful, . . . it is easy to find capital here to start an industry,—only knowledge is necessary.<sup>3</sup>

Eleuthère Irénée du Pont could write with happy assurance after nine years' residence in America that this was the land of opportunity—the new side of the cheese.

The story of the du Ponts' departure from "the rotten side that is called Europe" nearly a decade earlier is the immigrant story, but with considerable drama in motivation and incident. The du Ponts were neither royalist exiles nor penniless migrants. Pierre Samuel du Pont de Nemours, head of the family, was a self-made man whose career epitomized the Enlightenment. He had pro-

<sup>3</sup> E. I. du Pont to P. N. Harmand, January 28, 1809, in B. G. du Pont (ed.), *The Life of Eleuthère Irénée du Pont from Contemporary Correspondence, 1778-1834*, 11 vols. (Newark, Del., 1923-1926), v, 8, 147-148.

gressed from watchmaker to economist, author, educator, printer, philosopher, Inspector General of Manufactures, member of the Estates General, and briefly president of the Council of Ancients in the revolutionary government of France. Visionary and idealistic, he was thoroughly in sympathy with the demands for the reform of the Bourbon monarchy, but he respected tradition and sought change with moderation. His ideal of government was the British system—a constitutional monarchy where the king reigned but did not rule.

Moderation was swept aside, however, in the radical turmoil of the Reign of Terror and in the stalemated and corrupt ineffectiveness of the Directory that followed. The elder du Pont was twice imprisoned; close to the guillotine on one occasion and almost deported to the penal colony of Cayenne on another. At other times he was under house arrest, in hiding, or masquerading as an elderly physician to escape detection. Twice his printing establishment, in which his younger son Eleuthère assisted him, was wrecked on government orders. Many of his friends and associates had been even less fortunate—they were gone. Among them was Antoine Lavoisier who had taught Eleuthère the rudiments of powder-making at the Arsenal in Paris. France had no further use for scientists! And France was no longer a hospitable place offering a future for men of du Pont's talents and moderate outlook. He decided that he and his family would leave "the volcano" that was France.<sup>4</sup>

Du Pont had many friends who were Americans, among them Franklin, Jefferson, and Monroe. Lafayette was a close family friend. Du Pont's elder son Victor was in the French consular service stationed in Charleston and then New York. The father met Americans in France on government business and on private affairs, and also agents trying to sell American lands. One of the last publications issued by Chez du Pont, his publishing house, was the multi-volumed *Travels in North America* by the observant Rochefoucauld-Liancourt. Eleuthère was reading galley proof of this work in the months just prior to their departure from France. By such means father and son were kept informed about this

<sup>4</sup> See B. G. du Pont, *Du Pont de Nemours, 1739-1817*, 2 vols. (Newark, Del., 1933); Pierre Jolly, *Du Pont de Nemours, Soldat de la Liberté* (Paris, 1956).

country well in advance of their decision to migrate. After a long conversation with a Colonel Fulton, undoubtedly Robert Fulton, Irénée exclaimed to his wife:

Oh! how happy we would be, my Sophie, away from the volcano on which we live and established in the *promised land*.<sup>5</sup>

His first son, Alfred Victor, was born in the spring of 1798, and these words of bright anticipation were as much a hope for his son's future as for his own.

The young father prepared himself for life in the new home. Not as a printer, his most recent occupation, nor as a powder-maker—that did not enter his mind at this time. For the “grand projet” being planned by his father, Eleuthère's great usefulness would be as a botanist. Uppermost in the elder du Pont's mind, a mind teeming with plans and alternatives, was the establishment of a colony somewhere in the back counties of Virginia or Kentucky. It would be a model, planned settlement founded on the principles of the French physiocrats, a philosophy of which du Pont was one of the most articulate exponents. “He who tills his own soil will be satisfied.”

So Eleuthère, in the months prior to the family's departure, took a course in botany at the Jardin des Plantes, the botanical gardens of Paris. Ever serious-minded, he never missed a lecture and kept copious notes, “. . . so that they may be useful for my Sophie and her little ones.”<sup>6</sup> When the time came to fill out his passport he listed his occupation as “botaniste”—a less suspect vocation in wartime France than powdermaker or printer.

Thomas Jefferson greeted the du Ponts early in 1800 with a “. . . welcome . . . to our shore, where you will at least be free from some of those sources of disquietude which have surrounded you in Europe.” The vice president of the United States then cautioned against launching the settlement project. The times were bad, there had been a great deal of speculation and land values were abnormally high, and there were Americans in this business who regarded every stranger as lawful prey. Du Pont

<sup>5</sup> E. I. du Pont to Sophie du Pont, September 27, 1797, *Life of E. I. du Pont*, v. 4, 71.

<sup>6</sup> *Ibid.*, May 13, 1799, v. 4, 321.

should familiarize himself fully with the land situation. Possibly in another two or three years conditions would be more favorable.<sup>7</sup> Reluctantly du Pont gave up his dream of a "Rural Society," and he and his sons turned to other pursuits. About this time Jefferson asked du Pont for his views on education that he might consider them in planning the University of Virginia—"A short note on each science, such as you might give without too much trouble would be thankfully received." Du Pont responded within two months in a "note" running to 161 printed pages, entitled *National Education in the United States of America*, a volume worth the perusal of those interested in the philosophy and curricula of education in the early nineteenth century, as expressed by a gentleman of the French Enlightenment.<sup>8</sup>

Victor, elder son and former consular official, became a commission merchant in New York City where he handled foreign shipments, dealt in foreign exchange, and undertook purchasing assignments. But Victor was too affable and easygoing a person to succeed in business. In 1805 he failed when Napoleon's government refused to compensate him for expenses he had incurred in provisioning French troops and frigates in New York harbor. These forces had been on their way to the West Indies to put down the Negro uprisings led by Toussaint L'Ouverture.

Eleuthère had marked time for a number of months casting about for a gainful occupation. Tradition has it that in late summer of 1800 he was out hunting with a Frenchman, Colonel Louis Tousard, Inspector of Artillery for the U. S. Army. They were dissatisfied with the poor quality of American-made powder they had bought. Here the idea was born—why not start a gunpowder factory and utilize the training he had had under Lavoisier! Using French methods and French machinery Eleuthère was certain he could make black powder of superior quality. This was the beginning of E. I. du Pont de Nemours and Company.

The first decade, until 1812, was a difficult uphill struggle. The first powder sold to the government was used by the Navy in the

<sup>7</sup> Dumas Malone (ed.), *Correspondence Between Thomas Jefferson and Pierre Samuel du Pont de Nemours, 1798-1817* (New York, 1930), 3-4; *Life of E. I. du Pont*, v. 5, 143-147.

<sup>8</sup> P. S. du Pont de Nemours, *National Education in the United States of America*. Translated from the second French edition of 1812 and with an introduction by B. G. du Pont (Newark, Del., 1923).

Tripolitan War of 1805. But government orders were slow in coming and were not very large. Jefferson's passive neutralist policies could not sanction the stockpiling of munitions. The president did, however, praise the powder he had bought for his own hunting and blasting at Monticello as excellent. Du Pont had to battle rival powdermakers who tried to entice his workmen away and steal his equipment. There was prejudice in both trade and government circles because of his French origin—aggravated particularly when Franco-American relations were strained by Napoleon's maritime policies. The du Pont name did not appear in any local advertising for two years after he began his business.

The impression may have arisen that this first du Pont industrialist had become a wealthy man. His estate had grown. He had a comfortable, commodious home, at times bursting with his seven children and their kinfolk and friends whom they often entertained. Farmlands and orchard bordered the mills that by 1815 could produce over half a million pounds of powder annually. Markets were expanding as powder was used in quarrying, mining, canal and road construction, and on the pioneer frontier moving westward. But the business had been founded on borrowed money and more was borrowed to enlarge it. Throughout the founder's lifetime he was constantly concerned with paying off debts as they fell due. A visitor once made the remark, "Mr. du Pont is a man of great capital, which may disappear overnight." On more than one occasion shattering explosions almost destroyed his entire establishment. Not until three years after his death were all his obligations cleared. This task fell largely upon his eldest son Alfred Victor, and a son-in-law, James Bidermann.

## II

Alfred Victor was a baby in his father's arms when the family stepped ashore at Newport, Rhode Island, on New Year's Day, 1800. His boyhood on the Brandywine can be glimpsed principally through the letters written by his parents. The du Pont home was only five miles from Wilmington but 150 years ago that was virtual isolation for youngsters. Alfred's playmates were his sisters and brothers and the children of the powder workmen—the Murphys, the Callahans, the Boyds, the Harkins, the Flanagans—nearly all

Irish families recently arrived. When Uncle Victor's family settled on the opposite shore, he had some cousins with whom to play. Madame du Pont was a devoted mother giving the children the time she could spare from running a large household and directing the feeding and housing and laundry of the single workmen who lived in the company dormitory. She may have been the first company bookkeeper, for some of the earliest records appear to be in a feminine hand.

The woodlands surrounding the home and powder yard invited exploration by growing youngsters. Their curiosity about bugs, butterflies, animals of all kinds, snakes—of which there were plenty—shells, leaves, flowers, and minerals was encouraged by the parents who helped them with their collections. Alfred had a keen interest in mineralogy; his father brought home new specimens from his frequent trips. On a New England trip he wrote from Providence, “. . . I spent the evening gathering minerals for Alfred, which is not very difficult here, where the bones of the earth are very near the skin.”<sup>9</sup>

Alfred's early education was gained at home from his mother and father and elder sister Victorine. There may have been a private tutor now and then from Wilmington or Philadelphia. In the family circle French was spoken, so Alfred grew up in a bilingual household. French and American newspapers and journals were read. On the book shelves were Grimshaw's *History of England*, Aesop's *Fables*, *Recueil Choisi* (historical anecdotes), *Rosamond*, *The Good Aunt*, some Latin books, and an early prototype of Dr. Spock's best seller, *The Parents' Assistant*, two volumes.<sup>10</sup> Three publications of special import to the father were Niles' *Weekly Register*, like the *Wall Street Journal* an indispensable aid to men in business; the *Archives of Useful Knowledge* edited by James Mease, M.D., of Philadelphia, and *The Emporium of all the Arts and Sciences*, edited by the professor of chemistry at Dickinson College, Thomas Cooper.

In 1811 Alfred, at the age of 13, was not yet ready to absorb Mr. Cooper's lectures in chemistry. So for four years he at-

<sup>9</sup>E. I. du Pont to Victorine (du Pont) Bauduy, July 16, 1821, *Life of E. I. du Pont*, v. 11, 38.

<sup>10</sup>MS letters from Sophie du Pont and Victorine (du Pont) Bauduy to Henry du Pont, January 23, 28, 30, 1823, Eleutherian Mills Historical Library.



tended Mount Airy College north of Philadelphia where the curriculum was a classical one, along with some stiff work in mathematics taught by a Reverend Mr. Brosius, companion of Prince Gallitzin, and later to move on to Harvard University. The training was sound. It pleased the father who recommended Mount Airy College to several friends and business associates as a good school to which they should send their sons.

E. I. du Pont wanted his son to assist him in the powder business and to succeed him as its director. He did not scorn the liberal arts, but the best preparation for a young manufacturer of explosives was in the sciences. The father was well read in many areas of science; we know the books he bought and borrowed, his associations with such learned groups as the American Philosophical Society, and his correspondence with several of its members. Its librarian, John Vaughan, was both a du Pont powder agent and a friend. The Abbé Correa, Rafinesque, and Thomas Law were among du Pont's correspondents. In 1803 he expressed amazement that so few people knew that Priestley, "one of the greatest chemists of Europe," had established himself in Northumberland<sup>11</sup> And du Pont himself had been a student of Priestley's earlier contemporary, Lavoisier. He liked what he read of the practical applications of science to industry and manufacturing that appeared in Cooper's *Emporium*, and he approved his utilitarian view of education:

We teach our youth in vain unless we enable them to keep pace with the improvements of the day.

Cooper had also commented that "There are few chemists in this country among manufacturers."<sup>12</sup>

Cooper, in du Pont's opinion, was the man most eminently qualified to teach chemistry to his son, to train him to become the Du Pont Company chemist. It is highly probable that the father had read Cooper's introductory lecture, a masterly survey of the history of chemistry and an appeal for its recognition in the prac-

<sup>11</sup> E. I. du Pont to P. S. du Pont de Nemours, July 16, 1803, *Life of E. I. du Pont*, v. 6, 253.

<sup>12</sup> *Emporium of Arts and Sciences*, v. 2 (1813), 7; new series, v. 1 (1813), 18; Dumas Malone, *The Public Life of Thomas Cooper, 1783-1839* (New Haven, 1926).

tical arts. This lecture had been printed and widely circulated. And if the elder du Pont had read or had had reported to him some of the principles of education as set forth by President Jeremiah Atwater of Dickinson College in his inaugural address of 1809, he would have been doubly assured that Dickinson was the right college for Alfred. Natural philosophy, astronomy, and chemistry, especially the last, said President Atwater,

are sciences which I should always wish to see claiming a conspicuous place in education and exhibited for students as worth the most diligent study of all. . . . The sciences are viewed as important in other countries and governments, even monarchical ones, and are they to be considered of no importance as relating to a republican government? . . . We live under the full blaze of the gospel and the meridian lustre of the sun of science.<sup>13</sup>

But Atwater was soon to utter words in a different tenor—words that would make every parent pause and reconsider before entering his son at Dickinson. Atwater had not been in Carlisle very long before he damned that old frontier and barracks town as,

literally & emphatically Satan's seat. There pride and irreligion have long been enthroned and enjoyed undisputed dominion. . . . The higher class here have been little better than infidels.

The habits of Dickinson students were deplorable. They did "what was right in their own eyes—spending their time at taverns and in the streets, lying in bed always till breakfast, and never at the College but at the time of lecture . . . and caring nothing for any power which the faculty ever exercised." Atwater applied, with faculty cooperation no doubt, some stern remedial measures to the college community, and within a year's time Benjamin Rush could rejoice that his creation was no longer a "son of sorrow," but a "child of laughter to his heart."<sup>14</sup>

The span of rejoicing ended, however, when the college trustees,

<sup>13</sup> J. Atwater, *An Inaugural Address* . . . (Carlisle, 1809).

<sup>14</sup> Whitfield J. Bell, Jr., "Thomas Cooper at Dickinson College, 1811-1815," in *Journal of the History of Medicine*, VIII, 71-72. See also James H. Morgan, *Dickinson College: The History of One Hundred and Fifty Years, 1783-1933* (Carlisle, 1933).

against Atwater's wishes, named Thomas Cooper as professor of chemistry in 1811. This critical, contentious, and outspoken Unitarian, who even dared to criticize Christianity, would "poison the minds of youth." But Cooper soon proved popular both as teacher and as person with his students. Chemistry was a new, and for some a fascinating field; Cooper was a stimulating teacher and an able demonstrator; he invited discussion, and doctored the minor illnesses of his students with a supreme elixir—Madeira wine. An unbeatable combination, certainly worthy of a student accolade at class day festivities.

Entering college in 1816 was not preceded by the several hurdles and screening devices that have become part of the college entrance ritual in our time. Hence we cannot check back on Alfred du Pont's entrance or aptitude performances to see whether or not he was a student of promise. But he had an observant and articulate grandfather, du Pont de Nemours, who had returned from France in 1815 to live out his few remaining years with Irénée's family at Eleutherian Mills on the Brandywine. As Alfred, with his father and two sisters, who went along for the ride, set off in the family coach for Carlisle, fifty leagues away, in May, 1816, this was the grandfather's prophecy:

Alfred will not be what is called a scholar, but he will be a chemist, mathematician and mechanic. These are the most important actual sciences in our position. He has a great deal of ingenuity, skill and pontique strength of will.<sup>15</sup>

On another occasion the grandfather commented that Alfred had much ingenuity for mechanics, the practical sciences and useful arts. He possessed a strong and silent will.

At the age of forty he will be a man of lofty and powerful judgment.<sup>16</sup>

By coincidence Alfred did become head of the powder company in his fortieth year. But this is running ahead of our story.

With stops at Lancaster, Middletown, and Harrisburg, the du

<sup>15</sup> P. S. du Pont de Nemours to Madame du Pont de Nemours, May 29, 1816, MS letter, Eleutherian Mills Historical Library.

<sup>16</sup> *Ibid.*, November 15, 1816.

Pont entourage reached Carlisle on a Sunday afternoon in May after two days on the road. A satisfactory program of instruction was decided upon, though du Pont mentions no other subject than chemistry, taught by Cooper, when writing of these arrangements. Alfred's living arrangements were more difficult to settle upon. Dickinson students, it would seem, had backslid into habits of sloth and indifference since President Atwater's earlier efforts at reform. This was du Pont's comment to his wife:

Judge Cooper, who lives in the college, wanted Alfred to be there too and I regretfully consented because I saw nothing else to do. Fortunately I found out in time that it would be very bad for his work as well as for his recreation—he would have had to spend his evenings and Sundays in very bad company. I made a compromise arrangement that will avoid those two difficulties and yet give all the time he needs for study. He will go to the college in the early morning, have his breakfast and dinner there and stay all day; in the evening he will return for supper and for the night in a private house, where he has a very nice room, with nice people who will take good care of him and with whom he will spend his Sundays. Part of the time he will be with the family of our old correspondent, James Givin, who are very wholesome and respected people here. . . . Their son, who is Alfred's age, studies at the College, and will be a good friend for Alfred and prevent his making unfortunate acquaintances, as he might easily have done.<sup>17</sup>

These are the words of a loving and conscientious parent determined to see that his son got a good start on his college career in favorable surroundings and with the right kind of companions. As an alumnus some years later (1845) Alfred made a gift of some books to the Belles Lettres Society, one of which bore the title *A Father's Gift to His Children*, 2 volumes, by William Mavor, published in 1815. It is rather a nice thought that the father may have presented this to Alfred upon his entrance into the collegiate world. A second gift was a chemistry book by Thomas Ewell, M.D., a man who had gone into the powder business about 1810 and had become a strong competitor of du Pont's for

<sup>17</sup> E. I. du Pont to Sophie du Pont, May 21, 1816, *Life of E. I. du Pont*, v. 10, 150-151.

government business during the War of 1812. James Givin was in the class of 1817, a year ahead of Alfred. The younger Givin became a physician and died in 1825. Other associates of Alfred were James E. Madison of Virginia, President Madison's nephew, and John Winebrenner, founder of the Church of God.

Alfred's stay at Dickinson was of less than six months duration, from May to September, 1816, when the college closed. The closing was brought on by the feud between President Atwater and Professor Cooper which culminated in the resignation of both, and then of the greater part of the faculty. We have none of Alfred's letters to his parents, if he wrote any, during this semester. But we can glimpse a little of the intellectual fare he was absorbing from the "Minutes of the Belles Lettres Society" and from the record of books circulated among its members. In June Alfred was unanimously accepted into that society upon nomination by Martin Ewing, a Maryland youth who was elected president at this meeting. It would be interesting to know if Alfred, French-born and with French associations, participated in the debate on the question "Was it Proper for the Allied Powers to Interfere in Placing Louis XVIII upon the Throne of France," that the members held five days later. Dickinson students settled that issue in the negative despite Castlereagh, Metternich, and Tsar Alexander!

For the next meeting du Pont was one of a committee that framed the issue for debate, "Is an Extorted Oath Obligatory?" Here they were whetting their philosophical teeth on a contentious bone that has troubled man for ages, but one to which our more recent legislative bodies in their august wisdom have given quick and arbitrary answer. The conclusion of the Belles Lettres members was just the opposite.

Du Pont was elected president of the Belles Lettres Society at the July meeting when the society debated, "Was Brutus Justifiable in Murdering Julius Caesar?" The decision was in the negative. And seven years before President Monroe answered the question for them, Dickinson students had argued whether "It Would be Wise and Just for the United States to Declare for the Independence of South America and Assist Her to Obtain It?" We assume Alfred took a lively part in this discussion, both on grounds of national policy and because Latin America was a newly-opening market for the sale of American-made gunpowder. Alfred

was late for the August meeting—maybe the heat—and as a consequence he was fined  $6\frac{1}{4}$  cents for being three minutes tardy in opening the debate on the question, "Should the Rate of Interest on Money be Established by Law?" This subject was pertinent for these were years of "wildcat" state and private banking, during the interim between the death of the First Bank of the United States and the creation of the Second. The decision was in the affirmative; the students decided that the business community needed the stability which a fixed loan rate would supply.

Early in September Alfred applied for and received a diploma from the Belles Lettres Society. The last record shows that he had paid into the Society the sum of \$5.56½ during his membership.<sup>18</sup>

Of the classroom instruction Alfred received we have no inkling, but in view of his continuing as a student of Cooper's in Philadelphia after both had left Dickinson, it is certain that both father and son were satisfied with the instruction in chemistry. Some of the books that Alfred read at Dickinson give us some idea of his interests—or what his professors were requiring. The first books he checked out were six volumes of chemistry; two were F. C. Accum's *System of Theoretical and Practical Chemistry*, edited in 1814 by Cooper, and four volumes of Thomas Thompson's *A System of Chemistry*, a later edition of which Cooper edited in 1818. These were followed by three volumes of another Thompson's *History*. In July he found time to peruse a volume of *Naval Sketches*—his cousin was to become Rear Admiral Samuel Francis du Pont in the Civil War—and two volumes of *Scottish Chiefs* and four volumes of *Phedora* carried him midway through August, when he became interested in two volumes of *Female Biography*. He was then eighteen years of age. More manly fare followed with *McFingal*, *Mariners' Chronicle*, *Lord of the Isles*, and *Castle Rackrent*. He squeezed in a volume of *Select Plays* and some *Chinese Tales* before topping off this literary repast with *Roderick Random* and *Don Quixote*.<sup>19</sup> As every college student and alumnus knows, it is one thing to check out books and another to read them! If young Alfred read all these books in his five months at Dickinson, one might hazard the conclusion that he

<sup>18</sup> "Minutes of the Belles Lettres Society," Dickinsonia Collection, Dickinson College Library.

<sup>19</sup> *Ibid.*

read a good deal more in this short span than many a student of today reads in his entire four years in college. With this we take leave of Dickinson with Alfred and Dr. Cooper and journey to Philadelphia.

Alfred needed a vacation, so he went home to the Brandywine for a few weeks' rest. On a business trip to Philadelphia in early October his father met Judge Cooper who requested that Alfred join him at once. Cooper needed an assistant for the lectures and experiments he was offering at the University of Pennsylvania, where he was about to be appointed professor of chemistry and mineralogy in the faculty of natural science. Alfred responded with alacrity, bought himself some new clothes, and here began a master-apprentice relationship that served him well as du Pont's chemist in later years. It was Alfred's duty to prepare and assist in the experiments Cooper used to illustrate his lectures. Being trusted with experimental apparatus was a rare privilege for a student in the early 1800's even though they were only Cooper's domestic utensils. It appears, if grandfather du Pont de Nemours was correct, that teacher and pupil had not entirely severed their connections with Carlisle. Of Cooper, he noted,

He gives courses in both cities. Alfred will serve as his operator; that is the best way to learn.<sup>20</sup>

Throughout all of 1817 Alfred assisted and studied under Cooper at the University and at Cooper's home. Dr. Charles Caldwell, also on the Penn faculty, stated that only he and Cooper delivered lectures; all their colleagues were "sleeping partners in the concern."<sup>21</sup> In his introductory lecture Cooper outlined what the course would attempt to do:

I hope to give the natural history of the substances which are the objects of chemical investigation; then their artificial history; how to procure them; then their chemical

<sup>20</sup> P. S. du Pont de Nemours to Madame du Pont de Nemours, October 16, 1816, MS letter, Eleutherian Mills Historical Library.

<sup>21</sup> Charles Caldwell, *Autobiography of Charles Caldwell, M.D.*, Harriot W. Warner (ed.), (Philadelphia, 1855), 330. John H. Powell questions Caldwell's veracity when discussing his professional associates. E. P. Cheyney, *History of the University of Pennsylvania, 1740-1940* (Philadelphia, 1940), 206, states that Dr. Barton, Professor of Botany, was the "only member of the Faculty who lectured regularly."

properties when procured; and lastly their uses in medicine, in the arts, and in manufactures.<sup>22</sup>

Cooper also offered lectures, three a week for two to three months, in mineralogy, making use of some three to four thousand specimens. This series was open to the public at \$15.00 for the course.<sup>23</sup>

It was not an easy program for Alfred. He had to "stretch" to grasp all that the judge was expounding and demonstrating. His grandfather made this wry comment about his difficulties:

Alfred is at the home of the chemist Cooper, distilling his head in Alembics and Retorts, and breaking it against all the mineralogical stones.<sup>24</sup>

College vacation periods came later in the year a century and more ago. Cooper and Alfred worked and taught right through the hot summer months of 1817 until late August, when they took a three-month respite until late November. There is reason to believe that E. I. du Pont planned to have Alfred go to France for further study but a series of misfortunes made this impossible. The grandfather, du Pont de Nemours, died in August of 1817; an impatient shareholder, a member of the family, began legal proceedings to collect dividends she claimed were due to her; and in March, 1818, occurred the first really devastating explosion in the powder factory. It happened the day after St. Patrick's Day, a day liquidly celebrated by the Brandywine Irishmen. Over thirty persons were killed and many of the mills leveled to the ground. Du Pont's capital had virtually disappeared overnight. Alfred was needed at home to assist in re-building, and in salvaging the business. At the age of twenty his formal education ceased. Whether to him it was an occasion for regret, or relief, we do not know.

During Alfred's collegiate years there were no institutions offering the specialized type of technical education toward which a manufacturer's son might be directed. Chemistry was taught by medical faculties and most of its applications were made within the context of medicine. An able scientist such as Thomas Cooper

<sup>22</sup> *Port Folio*, v. 3 (1817), 201.

<sup>23</sup> *Analectic Magazine*, v. 10 (1817), 352.

<sup>24</sup> P. S. du Pont de Nemours to Madame du Pont, July 1, 1817, MS letter, Elcutherian Mills Historical Library.



who believed in the necessity of scientific competence in industry was a rarity, and E. I. du Pont considered it very fortunate that Cooper could supervise his son's collegiate education. On the other hand, the controversial temperament and the itinerant career of Cooper did not provide Alfred with a formal, lengthy period of preparation. The erratic course of his instruction was a serious handicap. Much later, in 1854, two years before his death, Alfred commented on the quality of the education he had received when contrasted with that of his younger brother Alexis:

Alexis . . . received an education far superior to that given me, in this our father was right, his means were more ample and he wished Alexis to have . . . the best that could be had.<sup>25</sup>

Alexis, and Alfred's own sons, Lammot, Alfred V., and Bidermann, attended the University of Pennsylvania in the '40's and '50's when such men as James C. Booth, "Professor of Chemistry as Applied to the Arts," Robert Hare, John H. Frazer, and J. W. Alexander were offering courses in industrial chemistry, geology, mining, and engineering. Institutions of higher education, by mid-century and the Civil War, had finally come to share Cooper's view that

We teach our youth in vain unless we enable them to keep pace with the improvements of the day.

<sup>25</sup> Allan J. Henry (ed.), *Life of Alexis Irénée du Pont*, 2 vols. (Philadelphia, 1945), v. 2, 192. For the teaching of chemistry in a number of universities see Wyndham D. Miles, "The Development of Chemical Education in Columbia, Princeton, Rutgers, and Pennsylvania Universities" (unpublished doctoral dissertation, Harvard University, 1955).