RESEÑA

Antoine-Alexis-François Cadet De Vaux

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RESUMEN. Antoine-Alexis-François Cadet de Vaux (1743-1828) fue un farmacéutico y químico aplicado que fundó el primer periódico diario en Francia y dedicó toda su vida a obras de filantropía y beneficio público en las áreas de la alimentación, salud pública e industrial, reforma de la condiciones sanitarias en prisiones y el traslado de cementerios hacia el exterior de las ciudades. Junto con Antoine Agustin Parmentier fundó la primera escuela francesa de panadería que elevó la calidad del producto al más alto nivel.

ABSTRACT. Antoine-Alexis-François Cadet de Vaux (1743-1828) was a pharmacist and applied chemistry who founded the first daily newspaper in France and devoted all his life to philanthropy and public benefit in the areas of nutrition, public and industrial health, reform of the health conditions in prisons, and the transfer of cemeteries outside the limits of the cities. Together Antoine Agustin Parmentier created the first French school of bakery that raised the quality of the product to the highest level.

LIFE AND CAREER[1-7]

Antoine-Alexis-François Cadet de Vaux (1743-1828) was born in Paris on January 11, 1743, the youngest son of Marie-Madeleine-Charlotte Godefroy and Claude Cadet (1695-1745), a surgeon at the *Hôtel-Dieu* in Paris who died in 1745 leaving his wife and thirteen children (seven boys and six girls) in dire misery. His father was a second cousin of Antoine Vallot (1594-1671), the Principal physician of Louis XIV (1638-1715). Initially, Joseph de Saint-Laurent (1707-1773), Treasurer of the Colonies and a friend of the family, took care of the lot and then had the children adopted by friends in different localities of *Mantes-la-Jolie*. Each of the brothers added to his name that of the place where they grew up. Thus his eldest brother Louis-Claude became Louis-Claude Cadet de Gassicourt (1731-1799) and Antoine-Alexis who was raised by a family living in the Vaux-de-Cernay region became Cadet de Vaux. His education and training followed the path of his eldest brother, Louis-Claude. After completing his studies at the *Collège des Quatre-Nations*, Cadet de Vaux first worked as apprentice in pharmacy and chemistry at the establishment of Claude Humbert Piarron de Chamousset (1717-1773) and then found employment in the prestigious apothecary shop owned by Claude-Joseph Geoffroy (Geoffroy jeune) (1685-1752) and his son, Claude-François (1729-1753), both members of the *Académie Royale des Sciences*. At this place he acquired a solid competence in pharmacy and in chemistry.[5-7]

On October 1759, when Cadet de Vaux was hardly 16 years old, he replaced his older brother Cadet de Gassicourt at the pharmacy of the *Hôtel Royal des Invalides in Paris* as *apothicaire major gagnant maîtrise*. Cadet de Gassicourt had just finished his six-year stage at the *Hôtel* and had obtained his brevet de *maîtrise* (mastery). The position at the *Hôtel* was limited to six years but had the advantage that at its end the appointee could receive, by royal decision, the *maîtrise* in pharmacy, a position that led into the pharmacy profession. Cadet de Vaux obtained his *maîtrise* on October 14, 1765 but remained at the *Hôtel* until October 1766 when he quit and was replaced by Antoine Augustin Parmentier (1737-1813). This event led to the beginning of a life long friendship and productive cooperation between Cadet de Vaux and Parmentier. Cadet de Vaux refused to carry on the *chef d'oeuvre* (master piece) required to gain membership in the *Corporation des Apothicaires Épiciers* and thus his name was not included in the list of *apothicaires* reported in Almanach Royal. Fortunately, the declaration of April 25, 1777, separated forever the grocers (selling mainly species) from the pharmacists, which became part of an independent organization under the name *Collège de Pharmacie*, joining finally the *maîtres-apothicaires* and the *gagnants-maîtrise*, which were now ranked in the lists published by the Almanach Royal beginning 1778. The 1778 publication contains the name of both brothers, de Gassicourt and de Vaux, one after the other.[7]

In 1769 Cadet de Vaux bought the pharmacy directed by Bertrand Chambeau, pharmacist of the Ministry of Justice. His many additional functions led him to sell it soon (1781) to Adrien-Jean-Baptiste Godard, *maître apothicaire* in Paris, in order to devote himself to his studies. Cadet de Vaux was a distinguished Latinist;

he translated the second edition of Jacob Reinbold Spielmann's (1722-1783) book *Institutiones Chemiæ*[8] [**1**] in a masterly manner. The original text was a confusing mixture of information from different references. The first volume (567 pages) begins with a preface of Spielmann to his students followed by one by Cadet de Vaux. Spielmann expressed he had written the book for the "*particular benefit of the students, in order to teach them Chemistry and to embellish the spirit of those who were not interested in exercising practical medicine and did not study for the vile intentions of a squalid interest, under the pretext of acquiring a vast reputation*". According to Cadet de Vaux, Spielmann's book although elementary, contained new facts, attractive experiences and ideas worth of having them known to the public. The strongest possible objection to the book was existence of another one, quite famous, written by Pierre-Joseph Macquer (1718-1784),[9] but Spielmann's one was different in the way it explained the fundamentals, the preparations, and the applications of the different subjects, not according to the three kingdoms but in a manner independent of the origin of the materials (today we would say: according to unit operations and unit processes). The first chapter of the first volume was a long description of the apparatus and instruments used in Chemistry, followed by chapters on dissolution, extraction, fusion, and distillation. The second volume (503 pages) described sublimation, calcination, precipitation, reduction, vitrification, and fermentation. The last chapter was a very long list of references and a detailed index of the different compounds mentioned in the book.

This translation bought Cadet de Vaux a wide reputation in scientific circles and was probably the reason for his being appointed *pharmacien en chef* (head pharmacist) of the hospital in *Val-de-Grâce*, followed by an appointment of professor of chemistry at the in Alfort (1771-1772), and some time afterwards, becoming Royal Censor for chemistry.[7]

In 1773, Cadet de Vaux married Louis-Victoire Delaplace; they had three children, Charles-Antoine (1774-?), Benjamin-Louis Cadet de Vaux (1779-1832), and Marcelin (1787-?).

In the middle of the 18th century, three main newspapers were printed in Paris; the weekly *Mercure* dedicated mainly to literature, the *Journal des Savants*, intended for the scholars, and the *Gazette* for those interested in affairs of the Crown. In 1777 Cadet de Vaux conceived the project of a *daily* newspaper, *Le Journal de Paris*, a paper that promised a daily feed to the curiosity and gossip of the Parisians. Cadet was fortunate to to engage the collaboration of Jean Baptiste Suard (1732-1817), Louis d'Ussieux (1744-1805), and Louis-Alexandre-Olivier de Corancez (?-1810). The new paper contained a review of books and arts, poetry, actuality writing, financial chronicles, gossip, news about science and astronomy, economic and agriculture reports, etc, etc. The journal was very successful, pretty soon it was making 100 000 francs per year for the owners and provided Cadet with such affluence that he could sell his pharmacy and to dedicate all of this time to the subjects that interested him, nutrition, hygiene and public health.[7] In Cadet's own words: "*Convinced that public benefit is the most noble privilege of sciences, I have always addressed this objective…*"[3]

At one time *Le Journal de Paris* was considered the official journal of the *Assemblée Nationale*; every day it gave an account of the sessions of the same. During the Revolution the journal stood strongly behind the *Club des Feuillants* [**2**] supporting its leaders Antoine Pierre Barnave (1761-1793), Gilbert de Motier, Marquis de Lafayette (1757-1834), Jean Sylvain Bailly (1736-1793), André Chénier (1762-1794), and Honore Gabrielle Riqueti, Comte de Mirabeau (1749-1791). The political spirit of the journal went farther of the Revolution platform until it became too dangerous; on April 12, 1792, its offices were vandalized, the presses shattered, the printing characters thrown out of the windows, and the reporters sent into hiding. It reappeared on October 1 with a more moderate and cautious line. Ultimately it closed down in 1837.[7]

On October 2, 1771 Cadet de Vaux became a member of the *Académie des Curieux de la Nature*. It is at this time that together with Parmentier and Henri Louis Duhamel du Monceau (1700-1781) he became active in rural and domestic economics. Together with Parmentier he founded (1780), installed, and taught at the *École de Boulangerie*. On June 8, 1780, Cadet de Vaux and Parmentier gave the inaugural speeches of the school, elaborating on the best ways of manufacturing bread, of grinding grains, the introduction of the potato in bread-making, etc, etc.[10] Very soon the school let to a notable increase in the quality of bread, then of very poor quality.

On August 28, 1789, the Bursar of the Generality of Paris, on learning that wheat grains were spotted, requested the help of the to remediate the problem. Cadet de Vaux and Parmentier found the means to increase the value of spotted wheat and the means for using it in the preparation of bread of good quality.

Cadet de Vaux occupied himself intensively on medical, scientific, and political subjects. In 1785 he became a member of the *Société d'Agriculture*, in 1787 of the American Philosophical Society, and in 1792 of the *Académie Royale des Sciences*. Between 1791 and 1792 Cadet de Vaux served as president of the department of *Seine-et-Oise* and in 1820 he was elected a member of the *Académie de Médicine de Paris*.

Cadet de Vaux was a generous and integer philantrope, boiling with original ideas, sometimes non realistic, which many times led people to make fun of him. Many of his activities before the Revolution were concerned with the disinfection of cesspools and wells, the reform of sanitary conditions in prisons, and industrial hygiene. In 1783, Benjamin Franklin (1706-1790), his close friend, designed for him a special stove using as fuel wood instead of coal. Following Franklin's suggestion, Cadet purchased American cornmeal and tested its properties as a food source. Corn was the least expensive foodstuff in relation to its caloric content.[7] Cadet de Vaux and Salles, from the Agricultural Society of Beziers, claimed that

Note 1. Jacques-Reinbold Spielmann was a physician who held the chair in chemistry, botany and medical matters, at the University of Strasbourg. The first edition of his book *Institutiones Materiæ Medicæ. Prælectionibus Academicis Accomodatæ* was published in 1763, the second in 1766. The latter is the one translated by Cadet de Vaux under the title *Instituts de Chymie*.
Note 2. Club of rightwing, generally royalist Revolutionaries, formed in July 1791 by secession from the Jacobins and meeting at the vacated monastery of Feuillant. Led by Barnave, it was very influential for a brief period, but was eliminated from the political scene when the monarchy was overthrown in August 1792.

corn should be reaped before it it became perfectly ripe. Their results indicated that the grains of corn reaped eight days before the usual time were fuller, larger, finer, and were never attacked by the weevil. A comparison between the corn collected from a given plantation, one half reaped before the usual time and the other half as customary, indicated that for 60 L, the flour from the former gave seven pounds of bread more than the latter. In addition, the weevil attacked the standard corn while the younger one was not. Cadet de Vaux and Salles recommended that the best time to reap the corn was when the grain pressed between the finders felt like the crumb of bread just baked.

Cadet de Vaux was appointed *Inspecteur de la Salubrité Publique* Within this appointment he had to examine an important stock of tobacco originating from Bretagne; he found that it was rotten and thus he reported. His findings indicated that it contained 25 % more water than the accepted limit and thus fermentation set in very fast. The providers tried to buy his silence, offering 100 000 francs. The response of Cadet was to throw into the sea all the unfit stocks. Within this same position Cadet criticized the noxiousness of certain tools used by businessmen, Milk was transported in copper vessels, which acted on the fluid. Thus milk, which was heavily used as a counter poison, became one of them. The salt peddlers and the providers of tobacco used copper balances, which were almost always covered with a layer of verdigris. Another dangerous material was the lead that covered the counters of wine merchants. The spilled wine became saturated with lead; since it was collected for an additional use, it resulted in many dangerous incidents. Cadet de Vaux observations were accepted by the Conseil du Roi and led to the prohibition of the usage of these metals and their replacement by inoffensive ones, such as tin plate and glazed pottery. The pertinent ordnances were issued in 1777.[3,7]

Louis Bénigne François Bertier de Sauvigny (1737-1789), intendent de Paris, assassinated at the *Hôtel de Ville* on July 22, 1789, who was interested in developing agriculture, thought about the idea of creating in every section of Paris an assembly of farmers, for internal discussion of agricultural subjects. This idea crystallized around 1785 and was so successful that it became necessary to regulate and organize the assemblies. Bertier assigned this task to the *Société d'Agriculture*, which in turn designated Cadet de Vaux and Pierre Marie Auguste Brousonnet (1761-1807) to carry on the job. The result was the creation of the *Comices Agricoles*, an institution that did not survive the Revolution. In 1793 a decree of the Convention eliminated all the scientific academies and literary societies, including the *Société d'Agriculture* and its dependent organizations. The *Comices Agricoles* were reestablished long after the death of Cadet de Vaux.[7]

Cadet de Vaux was one of the principal contributors to the *Bibliothèque des Propriétaires Ruraux* and *Cours Complet d'Agriculture Pratique*. Together with the philanthropists Armand Joseph Bethune (1738-1800), Duc of Charost, and Jules Paul Benjamin Delessert (1773-1847) they founded societies for the benefit and charity of mothers.

In 1788 Cadet de Vaux retired from political activities and moved to a estate he had bought in Franconville-la Garenne, where he spent the rest of his life, occupying himself on a wide spectrum of subjects and publishing a large number of memoirs, books, and instruction guides.[7] He wrote on many subjects dealing with public health and sanitation, a guide to minimizing the squalor of dwellings after flooding,[11] a study of the benefits and preparation of gelatin bouillon for the use of the sick and the poor,[12] methods for preserving crops, prevention of mole infestation,[13] cultivation of fruit trees,[14,15] and tobacco,[16] extraction of sugar from sugar beets,[17,18] forest conservation, paints,[19,20] steam laundries,[21] wine-making,[22] potato bread and other products,[23-26] and soup kitchens for the poor.

In Franconville Cadet de Vaux studied in particular fruit trees. He observed that hanging branches produced more fruit that the ones standing up. He believed he had found the reason for this, and published as a positive fact, something that would become confirmed by precise and repeated experiments. This method, offered under the name *arcure*, was tested in many gardens, but the effects did not respond enough to the promises. Cadet de Vaux's suggestions were published during the Republic or the Napoleonic Empire as part of Napoleon's effort to modernize commercial production through the application of scientific principles. In his pamphlet Cadet-de-Vaux discusses the growing, training, pruning and grafting of fruit trees.[14]

Cadet de Vaux died on June 29, 1828, of an attack of apoplexy suffered while at the home of his son Benjamin in Nogent-les Vierges, d'Oise. His tomb was destroyed during the damage suffered by the town during World Wars I and II.

SCIENTIFIC CONTRIBUTION

As customary of scientists of his time, Cadet de Vaux published a short booklet describing all his public and scientific results.[3]

Coffee

In a long memoir about coffee, published in 1806[27] Cadet de Vaux gave first a detailed historical review about the geographical origins of the plant and its grains, and a description of the medical and physiological properties attributed to the beverage prepared from it. According to the publication, this commodity should be investigated in detail because of the large tribute that France collected from it and the large consumption of sugar it represented, which enriched foreign countries. The memoir contains a description of the action of several chemicals on the aqueous extract of the grains. Potassium hydroxide and ammonia intensified the brown color, limewater generated an abundant flocculent precipitate, ferric sulfate converted it into black ink, while a solution of gelatin produced no reaction. Hydrogen chloride clarified the color a bit and further addition of alkali turned the liquid red. The aqueous solution turned litmus paper green. Treatment of the dried grains with cold alcohol produced a slightly colored solution and dissolved a large amount of a resinous principle. Addition of water to the latter gave a milky liquid, which precipitated the resin as a white powder. If the procedure was repeated with a solution of ferric sulfate, the precipitate was green; with nitric acid it was brownish. From these experiments Cadet concluded that coffee contained an aromatic principle soluble in water, a very small amount of an essential oil, an abundant amount of resin and mucilage, gallic acid, little tannin, and a little of albumin. The white precipitate formed with limewater was calcium gallate. Alcohol separated the mucilage because they are not soluble in this solvent; water precipitated the alcoholic extract because resins are insoluble in water. The last precipitate was white because it was formed in a highly powdery manner; it

became green with ferric sulfate because it was mixed with ferric gallate. In addition to these principles the ashes of coffee were found to contain calcium, potassium, iron, and carbon.

An infusion prepared from three varieties of dry green grains of coffee (commercial coffee), Moka, Martinique, and Bourbon, was distilled and the different fractions separated and analyzed. There was no difference between the Martinique and Bourbon varieties; the Moka one contained less resin, less gallic acid, more resin and more aromatic principle. Repetition of the experiments using roasted coffee showed that the process developed in the grain a pleasant fragrance and formation of tannin soluble only in cold water. The memoir ended with a recommendation on the ways to obtain a beverage having an agreeable aroma, a slightly strong taste, a nice color, and a certain density.

Exhumations and cesspools[28-32]

Cadet de Vaux, Parmentier, Louis Guillaume Laborie (?-1800) and Hecquet carried on some very important and unusual work on exhumations.[30] In 1452 the Church of Saint-Eloy, sometime the only parish of Dunkerque, was authorized to bury parishioners inside its building. Inhumations were a good income source to the church but with time they became a health danger to the parishioners. The humidity and saltiness of the ground generated germs and obnoxious odors that carried the risk of epidemics. The need to improve the building led a judge in 1777 to authorize the exhumation and transfer of as many bodies as possible to an outside cemetery. The responsibility of this operation was assigned to Hecquet, Chirurgien-Major of the Royal hospital as well as alderman of Eloy, with the assistance of Parmentier, Laborie, and Cadet de Vaux. Some of exhumed bodies were found to be dry and in a mummified state while others were putrefied. Mummification was assumed to be due to the constitution of the bodies and to the persons having been heavy drinkers (!). Several bodies showed all the signs that the person had been alive at the time of burial, but due to lethargy, assumed to be dead.

The report they issued recommended that in order to avoid the workers becoming ill they to had to carry a bottle with vinegar and, from time to time, rub their hands and faces with the liquid, and to add, from time to time, potassium nitrate and aromatic substances to braziers with burning coals, located around the site.

The exhumation techniques developed by Hecquet, Cadet, and Parmentier would be used afterwards (1786) to transfer the mass grave in the *Cimetière des Innocents* that infected one of Paris's quarters, located a few feet under the ground and flooding with its release of stench the places where the Parisian Halles Centrales are located today. This cemetery, dating from the time of King Philippe Auguste II (1165-1223), was the source of centuries-long complaints of many riverside residents. In a written document presented to the lieutenant general he neighbors stated that the common practice of burying bodies in common pits had led the soil of the cemetery to raise more than two meters above the level of the streets and resulted in the contamination of the cellars of the surrounding houses. More than a million bodies had been interred since King Phillipe Augustus; 23 parishes and the *Hôtel des Invalides* had the right to bury their dead in it. The only action taken by the Parlement in 1737 was to request the drawing of a descriptive map of the site. Around 1775 Cadet de Vaux presented his first report, which was communicated to the *Société Royale de Médecine* only three years later.[31] Jean-Charles-Pierre (1732-1807), the *Lieutenant Général de Police* (chief of police) of Paris, refused its immediate publication arguing that it would alarm strongly the public.

Cadet de Vaux conclusions were really frightening. The air of the cemetery was the most unhealthy that one could breath, the same as in the most repugnant of the hospitals. The houses were infected, the inhabitants were in danger, the bodies festered more than in other quarters of Paris, the debris of the coffins instead of being burned were used by the grave digger for his own use, etc., and if this was not enough, the cemetery was surrounded by a channel that received all the trash of the neighboring houses (Fig. 1).

In spite of a declaration in 1776 ordering the transfer of all Paris cemeteries outside the limits of the city, the actual operation had to wait for a 1785 decision of the *Conseil d'Etat* to clear the dead and convert the location of the cemetery and the Eglise des Innocents into an open space and transfer to it the vegetables and herbs market (*Marché des Innocens*). In order not to disturb the population, the transfer was to take place only at night and according to religious ordinances. On April 1786, Louis Thiroux de Crosne (?-1794), the *Lieutenant Général de Police*, inaugurated at the Catacombs the section reserved for receiving the bones. In Cadet de Vaux's words: *"The dangers of tombs in churches, or in cemeteries placed at the heart of towns, has long excited the zeal of several famous doctors. Nonetheless, the abuse continues"*. He discussed the traditional reasons for burials in occupied areas, and the history of the regulations surrounding the practice, described some of the dangers associated with burial in confined spaces, and cited a number of authors who expressed themselves angrily against the practice of burial in churches, including Voltaire (François-Marie Arouet, 1694-1778)[33] and Henri Haguenot (1687-1775).

The work on the transfer of cemeteries was followed by another one on the cleaning of cesspools.[32] The opening of public cesspools was the source of many accidents.[32,34] The poisonous air of the pits made their emptying a mortal trap or dangerous health danger to the workers. In addition, the operation released noxious fumes to the atmosphere. Again, Cadet de Vaux, Parmentier, and Laborie were requested to find a solution to the problem. They achieved the goal by a very simple and efficient procedure, entailing the use of lime and fire. The lime stopped the infection while a special furnace and ventilator located at the mouth of the pit provided an air stream that in a short period of time annihilated the poisons in the air and rendered it breathable.

Milk paint

Among the many projects developed by Cadet de Vaux was the development of paints based on milk and derivatives.[19] Current paints were based on white lead and oil, with the corresponding health problems. According to him, a paint based on milk had several practical and economical advantages, it was cheap, odorless, it kept for a long time, it could be prepared very easily, did not require fire or maintenance, took one hour to dry, and the quantity needed to paint a full house could be prepared in 10 min . The chalk it contained prevented the appearance of moss in walls and slowed down nitrification. The preparation procedure consisted in mixing 6.5 ounces of fresh slaked lime with enough skimmed milk until it looked like thin cream. Oil (linseed, caraway, or nut) was then added followed by additional skinned milk, and

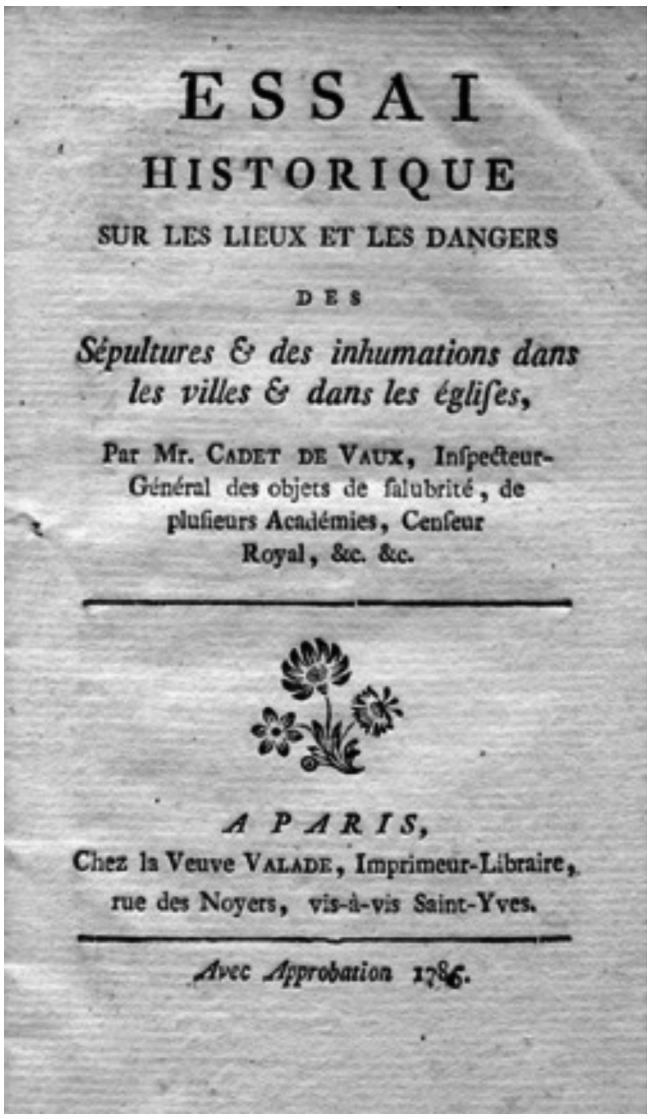
ESSAI
HISTORIQUE
SUR LES LIEUX ET LES DANGERS
DES
Sépultures & des inhumations dans les villes & dans les égliſes,
Par Mr. CADET DE VAUX, Inſpecteur-Général des objets de ſalubrité, de pluſieurs Académies, Cenſeur Royal, &c. &c.
A PARIS,
Chez la Veuve VALADE, Imprimeur-Libraire, rue des Noyers, vis-à-vis Saint-Yves.
Avec Approbation 1786.

Fig. 1. *Cadet de Vaux's book on the transfer of cemeteries.*

whiting, and the mixture stirred until it was well mixed. The total milk added was two quarts, yielding enough liquid to paint about 25 m^2. The resulting paint, which was applied with a brush as other paints, had a great solidity and enough elasticity, enabling it to be rubbed without injury, and was not blackened by sulfurous airs.

Sometime later Cadet de Vaux improved the formulation and properties of his paint by adding to it white Burgundy pitch. He named the new paint resinous milk paint. It was particularly useful for painting shutters, which were commonly protected with a layer of oil. The public reaction to this paint was mixed, some claimed it had a very bad smell and destroyed the color, while others claimed that Cadet de Vaux deserved national recognition for this invention.[7] Cadet de Vaux efforts did not stop here, he then suggested potato- and sand-based paints. The latter consisted in painting first the wood with oil and then sprinkling fine sand over it, According to Cadet de Vaux, this procedure was very appropriate for preserving doors, windows, shutters, and park benches because it gave wood a higher solidty than stones.[20]

Bleaching

At Cadet de Vaux's time bleaching was one of the most important activities of home economics. The current procedure was based on washing the clothes in the river or any water stream and then spreading soda and cinders over the cloth. Cadet de Vaux believed that use of steam was not only more effective and cheap but also represented a significant saving to the national expense by avoiding the import of substances produced abroad. His proposal went unheard by public institutions such as hospitals. For this reason he decided in publishing a practical manual appealing to the general public, particularly that of low income, which could not afford the equipment available for this purpose.[21] The basic idea was the establishment of public laundries where the public could bring their dirty clothes and carry on the bleaching. The institution provided the wood for the fire, the tubes, etc. for a very small retribution. In this manner, the usual procedure of washing and bleaching the cloths in the river was substituted by another carried on in a laundry establishment. The clothes were washed twice, squeezed, and then put in the tub to be steamed for several hours.

According to Cadet de Vaux, the income of the public laundry was enough to pay for all the expenses of the institution. Unfortunately, this new example of the generosity and philanthropic initiatives of Cadet de Vaux never came into practice.

Basic staples for the poor[7]

Cadet de Vaux devoted more than 40 years of his life developing the art of flour trade and bakery, particularly on making bread from potatoes, and trying to spread its use among the masses as a palliative for food shortages.

Parmentier (who introduced cultivation of the potato in France) and Cadet de Vaux started looking for ways of making bread based only on potatoes. At that time, the art of bakery was in its infancy. Bread was made routinely; it was of bad quality, aggravated even more by the unscrupulous use of rotten flour. To remediate this situation, Parmentier and Cadet de Vaux thought about the creation of a *école de boulangerie* (school of baking). This school was inaugurated on June 8, 1780 and Parmentier and Cadet de Vaux pronounced the opening speeches. It was administered by Henri Louis Duhamel du Monceau (1700-1781) and Mathieu Tillet (1714-1791), members of the *Académie des Sciences*, assisted by many millers and bakers, selected from the most educated in these arts, two professors (Parmentier and Cadet de Vaux), and a manager. Among the many products developed was one composed of potato flour and wheat flour to be used by the army and, particularly, by the navy (*biscuit de mer*) because it did not deteriorate during sea voyages and could be kept for years.[7]

The success of the *École de Boulangerie* was so great that Cadet de Vaux and Parmentier were charged with teaching the new methods of bread making in the provinces. Unfortunately the *École* did not survive the Revolution; on February 12, 1789 it was integrated into the *Société Royale de Agriculture*.

Within his activities as inspector of public health, Cadet de Vaux acted as supervisor of prisons. There the quality of bread was at its lowest and was many times the cause of rebellion. The actions of Cadet de Vaux led to a substantial improvement of the quality of bread. Eventually Parmentier convinced himself of the uselessness of making bread from potatoes, but Cadet de Vaux persisted in his error because of his intensive efforts to as an alternative to wheat at times of famine.[7,26,35] He wrote: *"Today (the peasant) continues to advocate bread making from this tubercle, in spite of Parmentier's opposition…".*[25]

According to Vauquier[7] the idea of making bone broth was not new. Denis Papin (1647-1714) had already proposed to extract the gelatin from bones in order to avoid scurvy during long sea voyages, as a consequence of eating only salted meat. The machine proposed by Papin for this purpose had been a complete failure; in spite of a long boiling, very little gelatin was released. Papin did not realize that to achieve the purpose bones had first to be crushed. Cadet de Vaux understood the problem and thus was able to prepare a very tasty, nutritive, and digestive bouillon. More important, an additional boiling carried on the following day, produced another batch of the broth.[36] Cadet de Vaux believed that bone broth was one example of what he called *soupes économiques* (cheap soups) or otherwise called *Rumford soups* (Benjamin Thompson, Count Rumford, 1753-1814, had formulated soups of this category during a famine in Munich. He also invented a stove that allowed preparing these soups very cheaply). Rumford stoves began being installed in Paris in 1800 and used to distribute hundred of soup portions per day. The idea spread very rapidly leading to the establishment of *a Comité Central des Soupes Économiques*, chaired by Cadet de Vaux. A curious fact is that the bone bouillon was never included within the soups being distributed to the poor! The reason behind this result was the resistance of the population to drink a soup of this nature.[12]

An American editor wrote that in the instructions published by order of the French Government by Cadet de Vaux, it was read the *astounding assertions*: *"A bone is a soup cake formed by nature. A pound of bones yields as much soup as six pounds of butcher meat. A bone case, a knife handle, or a dozen of knobs, are just as many plates of soup robbed from the poor!"* The editor also indicated that this hyperbolical language was also sanctioned by the *Académie de Médicine de Paris*.[37]

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