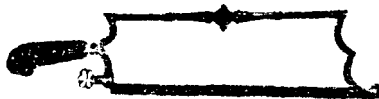


MEDICAL



COLLECTORS



ASSOCIATION

NEWSLETTER NO. 5

November 1985

Dear Colleagues:

This is the third and last Newsletter for 1985. In connection with that fact we are once again at the time for requesting dues for 1986. I have enclosed a form to be filled out for renewal of membership and dues payment for next year. I will follow the same policy as in previous years, i.e., only one reminder notice will be sent if we have not received the dues from members within a reasonable period of time. Please help me to keep the secretarial burden as small as possible and if you plan to remain a member for next year remit the dues as promptly as possible.

There are a considerable number of items of news for discussion, the most important of which is our planned meeting to be held April 17th and April 18th at the Smithsonian Institutions in Washington, D.C. I am attaching to the Newsletter a copy of the collated responses to the questionnaire about the meeting. Approximately 25% of the membership responded, which is I believe a pretty good response to this type of function. There was an overwhelming sentiment for a meeting in Washington, D.C., and a marginal commitment for the meeting in England. The actual results are tabulated for you to see in the attached form.

Audrey Davis and I have been discussing the program and activities and we have reached the following tentative conclusions. On Thursday, April 17th, a tour of the Smithsonian including the non-public areas is planned, and will be available to all who are interested. That evening there will be a cocktail reception and dinner. The site of the dinner has not yet been finalized; Bob Ruben was kind enough to offer to host us at the Cosmos Club, but unfortunately the activities rooms are all booked already for the evening of the 17th. Therefore, Dr. Davis will look elsewhere for a place to host us. This will be a Dutch Treat event. On April 18th we plan to begin the meeting early, probably about 8:00 AM and to run until about 3:00 PM, with a one hour break for lunch. Lunch will be held at the Smithsonian dining room and the cost of the meeting on Friday will be pro-rated among the attendants to cover the cost of coffee, danish, and possibly lunch, if that is arranged as a group rather than an individual function. Audrey currently projects a cost of about \$35 or \$40 per person for the meeting.

She is exploring the possibility of using the Marriott as our base hotel since that is quite nearby on Pennsylvania Avenue and is a relatively new facility. So far Dr. Davis and I have each planned presentations for the meeting. With

the mailing of the next newsletter we will be asking for formal submissions of talks which should be about one-half hour in length. This must be a participatory function. Without offers of discussions from the membership, its not going to be very successful. If you have some interesting information of any type you wish to present, please let us know. Following the meeting, from about 3:30 to 6:30 PM on Friday, the 18th, we plan to have available at the hotel a room where tables can be set up for dealers and where informal exchange of items among members can be carried out. The cost to the dealers for set ups will, of course, depend upon the rental of the room; we are trying to get this for as small a price as possible.

I will send out registration forms with the next Newsletter and we will begin to finalize plans for the meeting. Please put aside the dates if you plan to attend and please renew your membership since the meeting will only be open to people who are current members in 1986.

The second meeting in England, as you can see by the enclosed questionnaire response, had somewhat less enthusiasm. However, Dr. Dewey has informed me that he plans to proceed with making a meeting available in England and this will be co-sponsored by the Medical Collectors Association. Although a number of people indicated that they did not feel two meetings in one year should be held, it is my feeling that the difference between the two meetings is so great, that it seemed reasonable to proceed. The meeting at the Smithsonian should be considered the kick-off of what I hope will be a series of meetings of the group over the years to provide a format for discussion and social exchange. Dr. Dewey's meeting is a far more elaborate affair, for those individuals who would like to have a more extended amount of time devoted to this pursuit.

The identification column in the last issue of the Newsletter met with no success. Apparently no one was able to identify for me the object which was pictured. If you haven't looked at the photograph from the last Newsletter, please do and tell me if you think you know what it is. Since no one identified anything last time, I have included two items in this issue, one was submitted by David Coffeen, namely, an unusual caduceus, and the second a piece of medical pottery, was submitted by Anne Young. Please let me have your thoughts on these items so we can publish them in the next Newsletter.

Dr. Helfand's ephemera column is included once again and I have also photocopied an interesting piece of ephemera on the reverse side of his article, which is in my possession. The text is most interesting, amusing, and speaks for itself without commentary.

Dr. Pengelley continues his medical tour of Europe, and we have now crossed the English Channel and will be reading about France. A number of other chapters are yet to come and once again I would like to publicly thank him for this most interesting and useful contribution.

I have included the patent model column in this issue, but I am beginning to run out of patent models. I am sure there are among the many collectors other patent models of medical instruments. It is very easy to obtain a copy of the patent. All you need to do is go to the library, identify the patent from a United States patent catalogue and then write to the patent office with the number of the patent to obtain a copy. Once again, without active participation

from the membership, the Newsletter is going to run out of steam. The more of you who participate, the more interesting and useful this will become - after all that is its primary purpose. Please send me any material which you have which will be of interest or use for publication.

In that regard, a new addition has been made to the Newsletter. Alex Peck has written a brief article about various medical items which he found unusual and interesting and which passed through his hands. He has included the photographs of these items which I have had prepared by a photo offset process rather than the less expensive photocopy method, in order to provide optimum detail. This addition sets a precedent for the other dealers in the society. I do not wish to become involved in any kind of advertising, but if any dealer would like to promote the items he has available, I think this is a most useful and acceptable way. If you would write about the items in a manner which is useful and informative, and then include photographs, I can let you know the approximate cost of reproducing the illustrations and I will be happy to include articles modeled after the type that Alex has included simply if you agree to reimburse me for the additional cost of the photographic processing. In this manner the dealers will have an opportunity to advertise and the collectors will have an opportunity to acquire a little more useful knowledge.

A news item of some interest to those living in the northeast is that the Fraunces Tavern Museum will begin, on December 5th to hold an exhibition on the Healing Arts in America which highlights 18th century medicine. The exhibit is open to the public and should be of interest to members who pass through New York City. It will be on until the first week in June. Items have been lent to the museum from a number of collections of members of the Association, including my own.

I believe that this covers the major outstanding items and pretty well brings us up to date. I look forward to hearing from all of you and meeting as many of you as possible at the meeting of the group at the Smithsonian.

Sincerely,  
M. Donald Blaufox, M.D., Ph.D.

MDB:IR

PRESS RELEASE

March 29, 1985

The Theobald Smith House at 54 Alexander Street in Albany, N.Y., has just been purchased by Dr. Benjamin Pasamanick of Glenmont, N.Y., Research Professor of Pediatrics, emeritus at the Albany Medical College from which Smith graduated in 1883.

Theobald Smith, 1859-1934, was considered one of the giants of microbiology, public health and epidemiology. Amongst his many achievements was discovering that insects could be carriers of disease [influencing work on malaria and yellow fever]; first using killed microorganisms to induce immunity thus playing a major role in the development of vaccines for the major childhood diseases including the Salk vaccine; discovering the phenomenon of anaphylaxis, influencing the theory and research on autoimmune diseases; finding the difference between bovine and human tuberculosis, as well as numerous other important fundamental findings in human and animal diseases.

Smith's work was recognized internationally by many awards and honorary degrees. He helped found the Rockefeller Institute and was on its staff for over thirty years until his death at which time he was President of its Board of Directors. In his best seller Microbe Hunters Paul de Kruif begins his chapter devoted to Smith with the statement: "It was Theobald Smith who made mankind turn a corner. He was the first, and remains the captain of American microbe hunters."

The house on Alexander Street in which he spent his formative years is a simple three story brick structure which still retains many of its early charms but is rather dilapidated. Dr. Pasamanick, who borrowed the funds to purchase the house also attended Cornell and knew Smith's teacher Simon Gage in his last years. He hopes to convert the house into a public health museum with space for workers in public health history and is now seeking the necessary funds for its conversion and maintenance. The house will be placed in trust to the institutions or organizations who undertake its renovation and care. In the interim he has collected a number of artefacts and documents for the projected museum and hopes to receive others from workers in Smith's fields of interest. It is intended to request that the Theobald Smith house be placed on the National Register of Historic Landmarks.

Call or write for more information:

Dr. Benjamin Pasamanick  
Feura Bush Road  
Glenmont, New York 12077  
[518] 439-6894

CAN YOU IDENTIFY THIS?

Material: Cream colored pottery, 7.5 cm in diameter.  
Maker: No mark, 3 mm hole in back below rim.  
Presumed Use: Sick feeder?  
Date: 19th Century



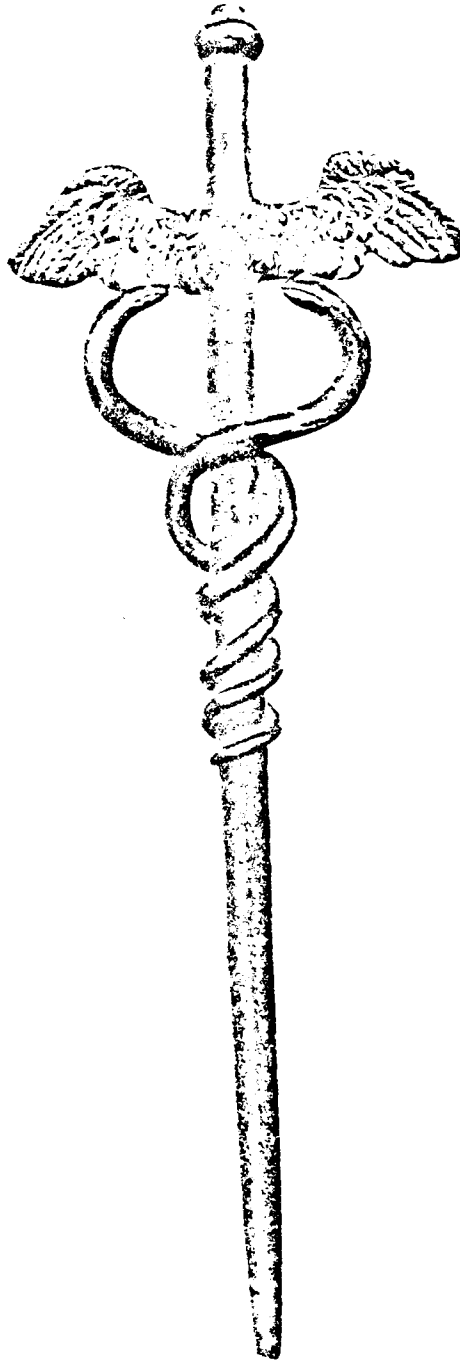
I think this is a:

From:

Please return to M. Donald Blaufox, M.D., Ph.D.

CAN YOU IDENTIFY THIS?

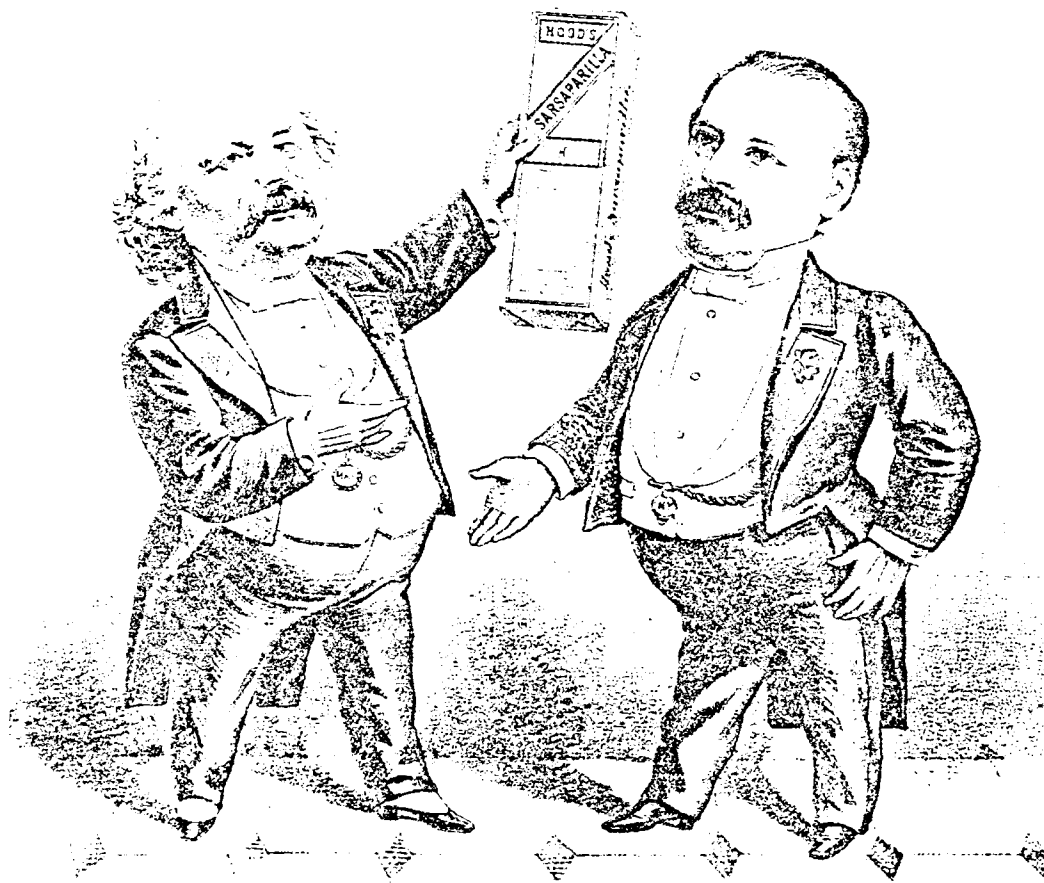
Material: Brass or Bronze 6 3/4" long.  
Maker: Unknown  
Presumed Use: Unknown  
Date: Unknown



I think this is a:

From:

Please return to M. Donald Blaufox, M.D., Ph.D.



### WHAT THE GOVERNORS SAID.

SAID THE GOVERNOR OF NEW YORK TO THE GOVERNOR OF MASSACHUSETTS IN ORDER BENJAMIN TO HAVE A PURE GOVERNMENT WE MUST PURIFY THE PEOPLE.

SAID THE GOVERNOR OF MASSACHUSETTS TO THE GOVERNOR OF NEW YORK RIGHT YOU ARE GROVER AND THIS IS THE PURIFIER THAT WILL DO IT HOOD'S SARSAPARILLA.

## Historical Images of the Drug Market – II

by William H. Helfand

Hood's Sarsaparilla was one of the most widely promoted nostrums in the latter part of the 19th century. Its manufacturers used a number of different techniques: trade cards, almanacs, jigsaw puzzles, posters, magazine advertisements, recipe books, fortune-telling books, and many others. The illustration, a caricature of an imaginary conversation between Benjamin Butler and Grover Cleveland, governors at the time in neighboring northeastern states, is taken from the front page of a house organ titled *Hood's Latest*, in 1883; it provides evidence that the company would resort to almost any device to keep the name of its product before the public. (Original of the illustration, 18.5 x 17.5 cm., is in the William H. Helfand Collection.)





Its action upon the system is unlike any other external remedy, inasmuch as it never drives the disease to take effect on the Internal Organs. Its properties when applied go directly to the diseased part, and, as it passes into the circulation, it separates all the poisonous and corrupt humors, and attracts them through the perspiring vessels to the surface, and in that way entirely eradicates the disease from the system. We warrant it to cure old Sores, Ulcers, Scrofula Sores, Salt Rheum, Sore Breasts or Nipples, Inflamed Eyes, Swollen Glands, Erysipelas, Boils, Scalds, Burns, Cuts, Bruises, Fistula, Piles, Corns, Bunions, Chilblains, Frosted Feet, and all cutaneous diseases on man and beast.

What is good for man is good for beast. PAGE'S CLIMAX SALVE acts like magic on horse flesh in curing Scratches, Mange, Old Sores, Fresh Cuts, Snake Bites, Bruises, Burns, Saddle and Harness Galls, Chafes, etc., and forces the hair to grow as soon as healed. It is put up in boxes three times larger than any other Salve, and sold at the low price of twenty-five cents per box. It is warranted to cure in every case or money refunded.

For Sale by Druggists and Dealers in medicine everywhere.

J. P. MILLS, Sole Proprietor,

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# ALEX PECK, ANTIQUÉ SCIENTIFICA

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## NOTES ON BLOODLETTING

One of the more popular areas of medical collecting is that of bloodletting instruments and paraphernalia. Several interesting and unusual items have recently crossed my desk.

The most primitive bloodletting device that I have in stock is a simple iron fleam probably produced by a smithy. (Illustration 1) It was apparently held by the curl and struck behind the blade with a mallet. This form of fleam is certainly as early as the 16th century as a variant can be found in Peter Lowe's, Discourse on the Whole Art of Chyrurgery first published in 1596. (Illustration 2) Davis, p. 73, illustrates another example which she dates to the 17th or 18th century. One can imagine that this type of easily made fleam continued to be used into the 19th century in remote areas.

An advancement in the above 'stick' fleam was the multiple-bladed fleam in which one or more blades pivot into a protective case. With this arrangement the user had readily at hand several differing sizes of blades to facilitate making an assortment of cuts. While this variant is common, the example here (Illustration 3) has an uncommon case. This brass case is carved with an elaborately designed scroll work based on a leafy vine. The raised pattern is set off by a black (bitumen?) background. The fleam is not signed and probably dates c. 1750-1800. Above it in the illustration is a fleaming stick of lignum vitae which was used to drive the blade.

An improvement on the 'stick' fleam was the spring lancet. The close relationship of the two can be seen in illustration 4 of a packet of spare spring lancet blades. In a spring lancet the blade is identical to a fleam but it is driven by a built-in hammer powered by a cocked spring. The advantage of the spring lancet is that it freed one hand and that it could be used in small areas such as the mouth. Germany produced a spring lancet which is shown to the lower left of the packet of blades. This spring lancet comes with a fitted case which has embossed on the lid TRAUNICHTESSTICHT, "Do not trust, it stabs." For another example, see Davis, p. 45.

Spring lancets were also produced in America and I have had a fine one signed Kern, Phila. (Illustration 5) This brass and iron bloodletting tool houses additional blades in its body. The spare blade that you see can be installed on the spring directly by a retaining lever. The example here is not driven by a separate hammer, but is now attached to the spring itself and the hammer is dismissed altogether. This lancet is thought to date to c. 1850.

An 18th century addition to the bloodletting armamentaria was the mechanical scarificator. When used with cupping, the mechanical scarificator allowed for greater control of numerous incisions and it avoided the tapping of a vein directly, which took skill and posed hazards. An early center for the production of the scarificator was Vienna. Illustration 6 shows two such examples from c. 1800 and signed WEIN. The scarificator on the left is particularly noteworthy. It is signed F.D., which may be the maker Peter Fisher discussed in Davis, p. 45. This belonged to Eloi Maillard, the barber to Joseph Napoleon, King of Spain during the Napoleonic era. Maillard eventually settled in Avon, Illinois in the 1830s, and recently I was able to acquire the scarificator indirectly from the estate of a descendant who had continued to live in Avon. This scarificator also has engraved on the top what appears to be two bleeding bowls.

Bleeding bowls themselves are interesting items to collect. A large and fine brass and fused-silver barber/surgeon's bowl from the 18th century is seen in illustration 7. This bowl is probably English and it has a ducal coat-of-arms engraved in the rim opposite the slot for the aristocratic neck. The engraving is done on an insert of silver which is thicker than the fused-silver surface and which can take the engraver's scratch without showing the brass core of the bowl. Though bleeding instruments have been depicted on ceramic barber/surgeon's bowls, there is a question as to the degree that such bowls were used in bloodletting (see Crellin, p. 273).

When bled by a professional bloodletter or physician one could expect to be charged a fee. Illustration 8 is of a doctor's bill dating from 1840 and coming from Dallas County, Alabama. It records the services of a Dr. Carr who attended Reubin Slaughter on 24 December 1836 and prescribed "2 vials medicine" and who charged \$2.00 for "applying the cups self." It is interesting to note that in 1846 the Hartford Medical Society printed a list of fees in which cupping was billed at \$1.00 to \$2.00. The fee schedule is reproduced in Novotny, p. 46. Therefore, in this instance, the cost of cupping in Hartford and in Dallas County, Alabama was the same in the 1840s.

Sometime after a second visit by Dr. Carr in January of 1837, Slaughter passed away. In order to be paid Carr had to file a sworn statement with an acting justice of the peace in 1840. The court then directed a Mr. Watts, the administrator for Slaughter's estate, to make payment in full. I suppose that a similar bill must have been presented to the estate of President Washington.

I encourage your comments on any material presented in this article. Certainly feel free to write or call regarding the availability of any of the items illustrated and the many other medical and scientific antiques that I may have in stock. I plan to submit for the next Newsletter, an article on Civil War era surgical kits made by Goulding, New York. Any information on Goulding will be appreciated.

BIBLIOGRAPHY:

Crellin, J.K., Medical Ceramics in the Wellcome Institute, London 1969.

Davis, Audrey, Bloodletting Instruments, Arlington, MA. 1983.

Lowe, Peter, A Discourse on the Whole Art of Chyrurgery, London 1654 (4th edition).

Novotny, Ann, Images of Healing, New York 1980.

Alex Peck, Antique Scientifica, POB 710, Charleston, IL 61920  
217/348-1009.

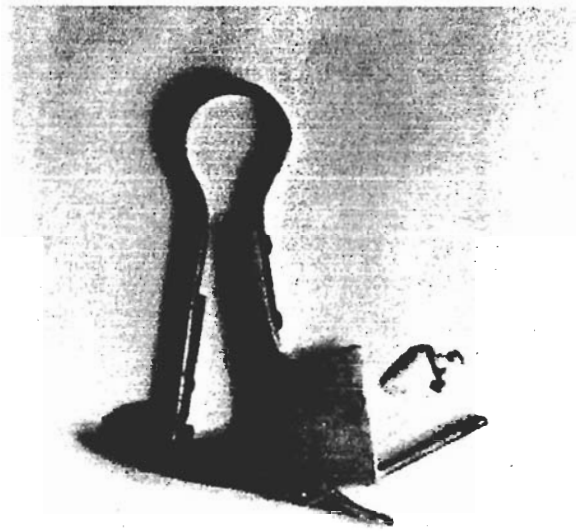


FIGURE 5

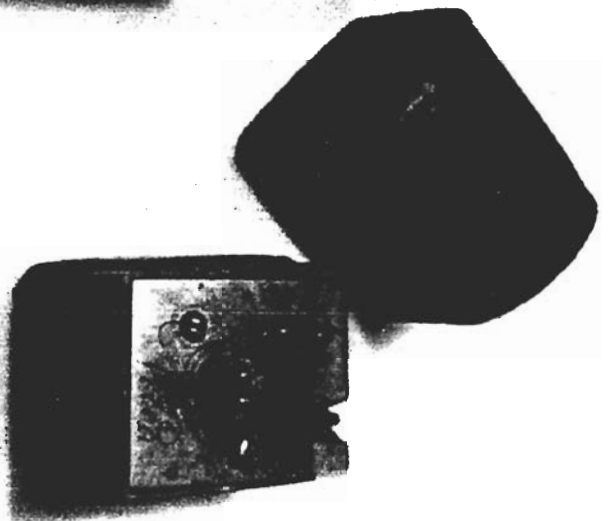
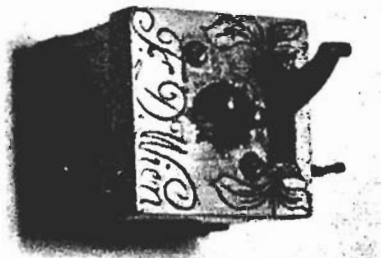


FIGURE 6

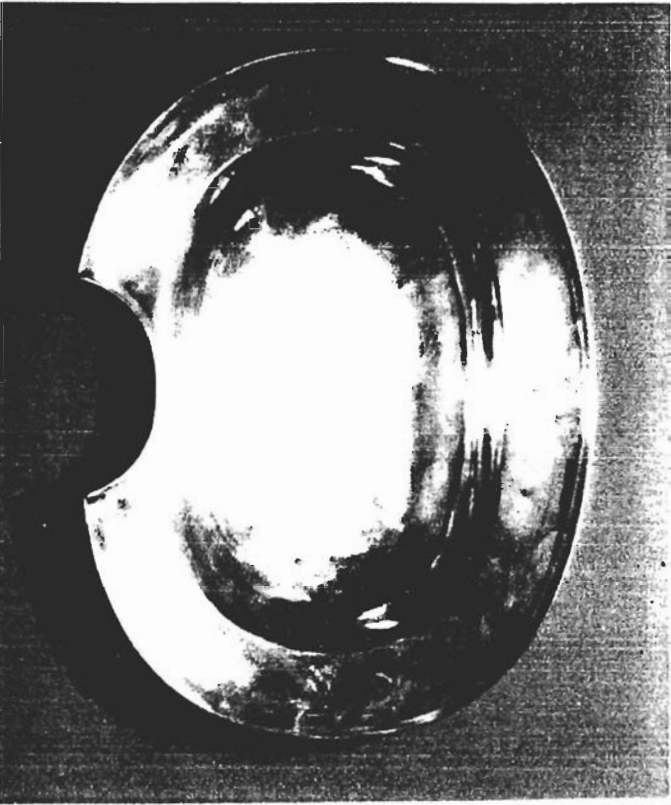


FIGURE 7

1828  
 I have the pleasure to inform you that the  
 above mentioned articles are now ready for  
 delivery and will be sent to you by the  
 next conveyance. I am, Sir, very  
 respectfully,  
 Yours,  
 J. G. Thompson

FIGURE 8

# UNITED STATES PATENT OFFICE.

JACOB DUNTON, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVEMENT IN PILL-MACHINES.

Specification forming part of Letters Patent No. 171,790, dated March 14, 1876; application filed February 15, 1876.

*To all whom it may concern:*

Be it known that I, JACOB DUNTON, of the city and county of Philadelphia, and State of Pennsylvania, have invented a new and Improved Pill-Machine; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1 is a side elevation, with the dies and compression-chamber in section, showing also in dotted lines the different positions of the movable dies and chamber; Fig. 2, a plan view of the base; Fig. 3, a transverse section of the same through line *x x*.

This invention relates to an improved machine for making pills by compression; and it consists in a movable or detachable compression-chamber or powder-receptacle, in combination with two movable dies having concaved ends, the upper one of which forms the plunger, and the lower one of which is made short, and is adapted to be driven through a hole in a base piece together with the pill.

The invention also consists in the construction of the base-piece, which is provided with a hole terminating in a laterally-discharging curved chute, by which the pill and lower die are driven out of the chamber into a convenient position; and it also further consists in the combination, with the powder-receptacle, of the base-piece, provided with guides, which permit the powder-receptacle to be shifted from its position for compressing to its position above the hole for discharging the pill without displacement, and without the delicate adjustment which would be otherwise required.

In the drawing, A represents the powder-receptacle, which constitutes also the compression-chamber. This receptacle is perforated vertically and longitudinally with a hole, in which are accurately fitted the dies B B', of which B constitutes the plunger, through which the application of power is made to effect the compression. Both these dies are movable and entirely detachable, and have their adjacent ends concaved, so as to give sphericity to the pill compressed between them. The lower die B' is made short, and is de-

signed to be driven out with the pill through a hole, *a*, in the base-piece C. Said base-piece is made with ears *b*, having screw-holes through them, by means of which it may be firmly secured to the counter or stand; and its upper side is provided with an oblong recess or depression, *c*, in which rests the powder-receptacle A. This recess is rounded at the ends with a curve corresponding to the circumference of the powder-receptacle, and the transverse dimension of the recess is the same as the diameter of the powder-receptacle. In one end of this recess the pill is compressed, and the chamber, with the dies and pill, is then slid to the opposite end, over the hole *a*, in which position the pill, with the lower die, is ejected downwardly through the hole by a tap upon the plunger, which latter is provided with a head or knob to receive the impact of the blow, and to prevent the plunger from going through.

The base C is made of considerable height, so as to enable the hole *a* to be conveniently curved to one side, so as to form a laterally-discharging chute.

This arrangement permits the base to set solid upon its support, and yet brings the pill and the discharged die into a convenient position for removal and replacement without lifting up the base.

In operating my devices the sides of the oblong recess simply operate as guides for the powder-receptacle in being moved from one position to the other; and I therefore do not confine myself to a recess for this purpose, but may employ any other form of guides, and as modifications of this feature of my invention pins may be arranged to form guides and stops, or a raised continuous guide may be employed.

Having thus described my invention, what I claim as new is—

1. The removable powder-receptacle A, the detachable plunger B, and the smaller lower die B', in combination with the base-piece, having a hole through which the pill and lower die may be together downwardly discharged, for the purpose described.

2. The movable powder-receptacle A and the detachable plunger B, in combination with the base-piece having a hole, *a*, which termi-

nates in a laterally-discharging chute, for the purpose described.

3. The movable powder-receptacle A and the two movable dies B B', in combination with the base-piece C, having guideways upon its upper surface, as and for the purpose described.

4. The movable powder-receptacle A and

the detachable plunger B, in combination with the base-piece, having a hole through which the pill may be downwardly discharged.

JACOB DUNTON.

Witnesses:

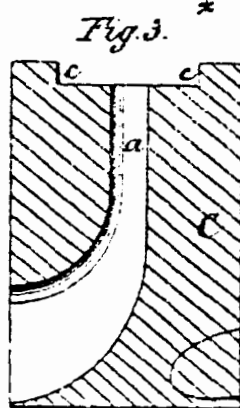
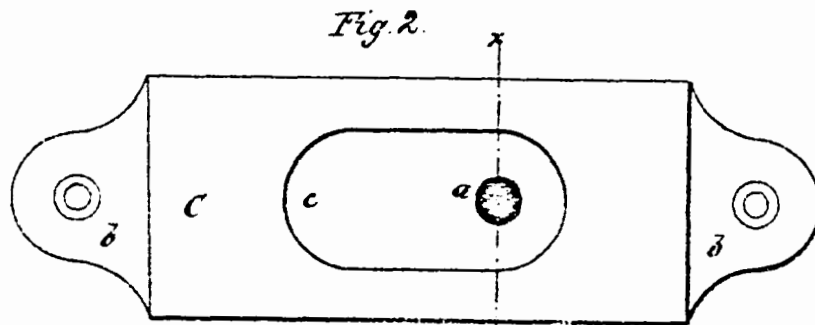
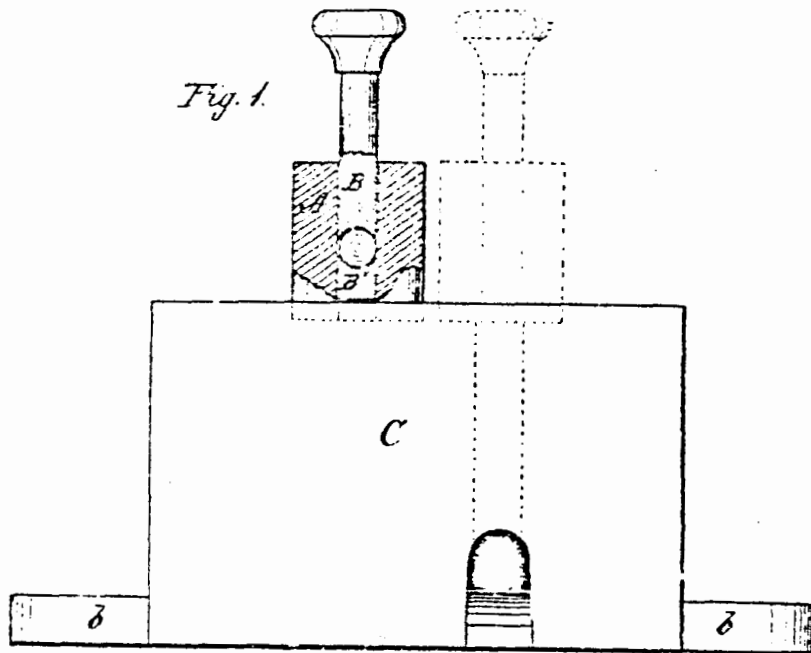
WM. D. WALTON,  
E. W. MEVINS.



J. DUNTON.  
PILL MACHINE.

No. 174,790.

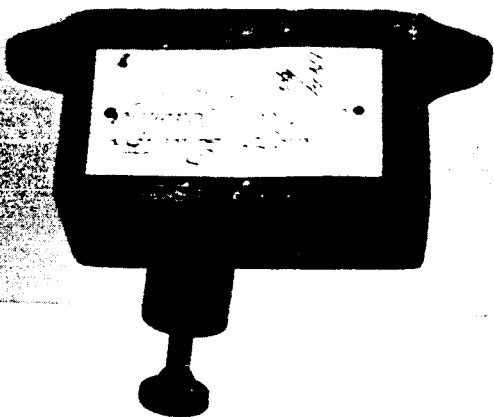
Patented March 14, 1876.



WITNESSES:  
*W. W. Hollingsworth*  
*John K. ...*

INVENTOR:  
*Jacob Dunton*  
BY *[Signature]*

ATTORNEYS.



MEDICAL MUSEUMS OF THE WORLD

PART III

FRANCE

By  
Professor E. T. Pengelley

## FRANCE

On the whole France is very good at preserving the historical aspects of her culture, but there have been some lapses. In particular the destruction that took place during their revolution (1789). A sorry chapter in human history, from which the historical associations of medicine and biology did not escape. Despite this, France is a wonderful country in which to see many aspects of medical and biological history. In order to see and appreciate these however, it would be well if you spoke a little French!

### ARBOIS (Jura)

Location - 390 kilometers southeast of Paris

Train - From Paris (Gare de Lyon) to Dijon and Dole, and then by taxi or bus to Arbois.

Road - Take the A6 (la Route du Sud) to the south and exit at Beaune onto the N73 towards Dole. Before entering Dole turn right onto the N5 towards Vaudrey and at Vaudrey branch onto the N469 (also the D469) to Arbois.

Arbois, Jura, is a pleasant small town in Eastern France, not far from the Swiss border, and it was here in 1827 that the parents of Louis Pasteur (1822-1895)--see under Dole and Paris--established the family home, "Maison Familiale," which is now the Musee Louis Pasteur, and virtually a French national shrine. Pasteur was brought up here, and often returned here during his life.

Musee Louis Pasteur  
83 rue de Courcelles  
Arbois

Opening Hours: April 15 - September 30th: Daily 10.00-12.00 and 14.00-17.30.

November 1 - April 14th: 10.00-11.30 and 14.00-15.30.

It is closed Tuesdays.

There is a charge for admission and descriptive literature is available. There is also a guided tour (in French!) every half hour.

--It should be noted that there is another Pasteur Museum in Dole, only 30 kilometers away, and it is closed on Mondays. However, the two should be visited at the same time.

With the possible exception of Napoleon Bonaparte, no Frenchman is held in higher esteem than Louis Pasteur. He was certainly one of the great geniuses of all time, and his contributions to human welfare unsurpassed.

Louis Pasteur's father, Jean-Joseph Pasteur, was a native of Besançon and a tanner by trade. He served with distinction in the Grand Army of Napoleon, but after the latter's defeat at Waterloo in 1815, Jean-Joseph was discharged from the army, and settled in Dole in a house on the banks of the

River Doubs where he could pursue his tanner's trade. Here in 1822 Louis was born, but when he was 5 his family moved to nearby Arbois, where the family home was established, and where Louis was brought up. His father was an avid believer in education, and took a personal interest in the schooling of his children to the point of going over their homework every evening and making sure they were progressing satisfactorily. Louis attended the local school in Arbois, but when he was 17 he went to the Royal College in nearby Besançon. At this time he displayed a remarkable talent for art (drawing, painting, etc.), and in fact he worked at this, from time to time, all his life. The art work he left is of high quality, and there is no doubt he could have been a professional artist had he so desired. Three years later in 1842 he received an arts degree from the Royal College, but it was not until he went to Paris the following year that he displayed any aptitude for science. In Paris he was admitted as a chemistry student to the prestigious École Normale Supérieure (see under Paris), then, as now, France's top college. Here he studied for 4 years, receiving his doctor's degree in 1847 with a thesis on crystallography. This terminated his formal education, and despite his immense contributions to biology and medicine, Pasteur was never a biologist or medical doctor. The research which he did for his doctoral thesis is known best to organic chemists, but his discoveries have had enormous impact far and wide. Basically what he accomplished was to show that two or more compounds of identical composition (he worked with tartaric acid) may display totally different properties, and he demonstrated that this was due to isomerism (i.e., the different arrangement of the atoms within the molecule). With this demonstration, stereochemistry (space chemistry) may be said to have begun, and the effects of this on chemistry, biology and medicine have been profound. Very few scientists have contributed really significant ideas and become famous while they were students. Sir Isaac Newton was one, so was Marie Curie and Louis Pasteur was another.

In 1849, Pasteur was made a professor at the University of Strasbourg in eastern France. Here he continued his studies of crystallography, but perhaps more important to him personally was that here he met and married Marie Laurent, the daughter of the Rector of the University. She was his devoted wife until his death 46 years later, and she outlived him by 15 years. Madame Marie Pasteur, catered to her husband's needs, nursed him through illnesses, and brought up their children. She indeed is entitled to share in the triumphs of her husband, and the praise showered upon him.

His appointment at Strasbourg was followed in 1854 by a similar one at the University of Lille in northern France, and here he started his work on the causes of fermentation which was to lead to his most important discoveries, both theoretical and practical. His appointment at Lille lasted only three years, for in 1857 he returned to his old college, the École Normale Supérieure, in Paris as Director of Scientific Studies. The research he started in Lille was on the phenomenon of fermentation, and it is important to realize that at that time virtually nothing was known as to how this took place. What Pasteur demonstrated was that it was the presence of minute but living organisms which caused fermentation, that different microorganisms caused different kinds of fermentation, and that some of these microorganisms grew in the absence of free oxygen. In time he also demonstrated that putrefaction was due to the presence of living organisms. The resulting applications of these discoveries were striking and rapid in coming, for not

only did they open up a rational explanation of many biological phenomena, but also a means of controlling them. Thus it was possible to understand and control the fermentation of such things as beer and wine. In 1863 Pasteur was credited with saving the French wine industry, and no Frenchman ever performed a more patriotic act than that! This work also quickly led to the process we now call pasteurization, with all its beneficial consequences. The significance of his explanation of putrefaction was quickly understood by Joseph Lister in England (see under Glasgow and Edinburgh), and led to Lister's work in antiseptic surgery and therapy. Indeed Pasteur's work on microorganisms laid the foundation of the whole concept of the "germ theory of disease" with all its subsequent ramifications.

Pasteur's work on microorganisms also led him to a solution of a very important biological problem. In the middle of the 19th century, it was a hotly debated subject as to whether microbes could arise in the absence of other microbes. That is, could they come into existence by the so-called process of "spontaneous generation" from inanimate material? At that time it was not an easy problem to solve, but by rigorous design and clever experimentation he proved, in a remarkably short period of time, that spontaneous generation of microbes was a myth, and that all microbes were descended from other microbes. His conclusions have never seriously been challenged since.

By this time Pasteur was a very famous man, and his advice and services much in demand. In 1865, at the request of the French Government and the Emperor Napoleon III, he undertook to study the diseases of silkworms which at the time were devastating the important silk industry. These studies took nearly 5 years, which were interrupted for a long period in 1868 when Pasteur suffered a severe stroke which caused permanent paralysis of his left side--he was only 46. However, he recovered sufficiently to continue his work, and in due course not only solved the problems that were destroying the French silk industry, but at the same time realized the importance of experimental research on microorganisms in the study of biology and pathology. As a result of this realization he went on in the years that followed to attack the problems of many virulent diseases, including anthrax in sheep, chicken cholera and puerperal fever in humans. His successes were truly remarkable, one vaccine after the next was developed, including the attenuation of viruses which gave a means of controlling the deadly disease rabies, and subsequently many others.

As Pasteur grew older, the pace at which he worked inevitably declined. The French Government built in his honor, the Pasteur Institute in Paris, which contained private apartments for him and his wife. These are now a magnificent museum (see under Paris), but the research work of the Institute, today greatly expanded, continues in the Pasteur tradition. However, the culminating tribute to Pasteur occurred on December 27, 1892, his seventieth birthday, when France honored him in a public ceremony held in the main theater of the Sorbonne. Almost every country in the world was represented, along with a distinguished international group of scientists. Pasteur was by this time in poor health, and his voice weak, but he bravely replied to the honors conferred upon him, and in so doing his life-long humanitarianism shone through. He said in part, "You have come from so far to give a proof of sympathy for France, you bring me the deepest joy a man can experience,

who believes invincibly that science and peace will triumph over ignorance and war; that peoples will come to a common understanding, not to destroy but to build, and that the future will belong to those who will have done most for suffering humanity...." --Modern political leaders please note!

Louis Pasteur has often been described as the "ideal scientist," because not only were his scientific discoveries of unsurpassed importance and benefit, but all his life he was devoted to his country, his parents, his wife, his children and humanity at large. He was always in sympathy with those in trouble, and no one ever did more to help them.

The Maison Familiale in Arbois, together with the Maison Natale in Dole, are owned and operated by the "Société des Amis de la Maison Natale de Pasteur à Dole." Each house has a curator ("le gardien"). There have been no essential alterations to the house in Arbois since Pasteur's day, and it is beautifully preserved. There is a ground floor, with two floors above, and the rooms are furnished with many objects associated with Pasteur and his family. His laboratory and study are located upstairs, and the former has a lot of the equipment he used for his experiments. In his study is a magnificent library, which contains all his works in their first editions, as well as much more. There are also many original documents, etc. associated with him. A visit to this museum, dedicated to preserving the memory of Louis Pasteur is a thrilling experience for one and all. The visitor to Arbois should also see the very lovely statue of Pasteur in the main square of the town, an easy walk from the Maison Familiale.

### BEAUNE (Côte-d'Or)

Location - 310 kilometers southeast of Paris.

Train - From Paris (Gare de Lyon) to Dijon and Beaune.

Road - Take the A6 (la Route du Sud) to the south and exit at Beaune.

Beaune, Côte-d'Or, is primarily noted for two things. First it is the focal point of the Burgundy wine area, and secondly it has one of the oldest surviving hospitals in the world. It is a fascinating old town, with origins as far back as the 7th century. At first it was the capital of a separate Duchy, but in 1227 this was united to Burgundy, and became the seat of the Dukes of Burgundy. It is commonly referred to as "the wine capital of the world," and every year merchants come from the four corners of the earth to sample and bid for the wines of the area.

Hôtel-Dieu  
Place Carnot  
Beaune

Opening Hours - Daily 9.00-11.15 and 14.00-17.00. There is a small charge for admission, and may be seen by guided tour only. These tours are in French, but a printed English summary is available, along with other literature.

This is one of the oldest surviving hospitals in the world. It was founded in 1443 by Nicholas Rolin, Chancellor of Burgundy, and his wife Guigone de Salins, in response to the misery prevailing at the time. It was initially an endowed institution, and possessed large areas of land. These lands, then as now, are largely vineyards, producing some of the best wines in the world. Thus while the buildings are old, and the rules, customs and uniforms of the nursing sisters remain the same as when the hospital began caring for the sick, the vast wealth provided by its vineyards has enabled it to have the finest equipment and doctors in France.

By far the most impressive part of the hospital is "La Grand Salle," sometimes referred to as the Paupers Ward. It is in fact a combined hospital ward and chapel, so arranged that the patients confined to bed could take part in the religious services going on in the chapel. The overriding concern of the hospital being to save the soul as well as the body! This ward was used regularly until 1948, but is now simply maintained as a showpiece. It is 52 meters long, 16 meters high with a gothic vault, and a very impressive place. The beds down each side of the ward are "in built," with double beds for two patients each! The chapel was damaged during the Revolution, but was restored in the 19th century. It contains some magnificent stained glass windows. Other areas of immense interest include the Great Courtyard, the original kitchens and the dispensary. The latter restored in the 18th century, contains a remarkable collection of historical eating utensils used by the sick; jugs, mugs, bowls, etc., as well as drugs, medicines and medical instruments. Finally there is a special room housing the famous painting of "The Last Judgement" (painted about 1444) by Roger Van de Weyden, which was commissioned for the original hospital by its founder, Nicholas Rolin, and has been there ever since.

The Hotel-Dieu is not only a very interesting architectural structure, but is of great interest in the history of medicine. Long may it live, and the vineyards that support it! The visitor to Beaune should also not miss the Wine Museum, formerly the Palace of the Dukes of Burgundy.

#### DOLE (Jura)

Location - 360 kilometers southeast of Paris.

Train - Paris (Gare de Lyon) to Dijon and Dole.

Road - Take the A6 (la Route du Sud) to the south and exit at Beaune onto the N73 which leads directly into Dole.

Dole, Jura, has a history going back to Roman times. Later it was part of the Duchy of Burgundy until 1479 when it was captured and burnt by the army of Louis XI. Later still it fell into Austrian hands, but in 1674 was restored to France by Louis XIV. Perhaps more important than all this however, is that it was here, in 1822, that Louis Pasteur (see under Arbois and Paris) was born in his parents' house on the banks of a canal adjoining the River Doubs. The house is now a museum.



La Maison Natale de Pasteur  
43 rue Louis Pasteur  
Dole

Opening Hours - Tuesday to Sunday, 10.00-12.00 and 14.00-16.00. Closed Mondays. There is a small charge for admission, and a tour is available in French. Various types of literature are available.

La Maison Natale de Pasteur is just off the Quai Pasteur on the Tanners Canal, which is a short walk from the main street of the town. The house was built in 1750, and on December 27th, 1822, Louis Pasteur was born in one of the front rooms. It is preserved much as it would have been at that time. The other principle room in the house is, "La Salle A. Ventard." This was originally the tanner's drying room, but now a museum with a host of memorabilia very well displayed. The room is rich in documents and papers concerning Pasteur's work, as well as a valuable collection of his books in first editions. There are also photographs and paintings depicting various events in his life starting in early childhood. Also of extreme interest is a fine collection of Pasteur's chalk drawings and other art work, for which he had a remarkable talent. Visitors should also not miss the basement (Les Caves) of the house, with all the apparatus of the tanner's trade still preserved. Finally there is a very imposing statue of Pasteur in the park nearby.

It is hard to choose between this museum and the one in Arbois, both are truly gems, and both give an insight into the very simple background of Louis Pasteur, a simplicity to which he continued to adhere all his life.

#### MONTPELLIER (Herault)

Location - 750 kilometers south of Paris.

Train - Paris (Gare de Lyon) direct to Montpellier.

Road - Take the A6 (la Route du Sud) as far as Lyon. Then join the A7 to Orange and the A9 to Montpellier.

Montpellier is on the river Lez and is situated only some 10 kilometers from the shores of the Mediterranean Sea. Originally it was a port, but over the centuries the land filled in, and the town of Sete is now Montpellier's port. Today Montpellier is a large, prosperous industrial town with a most interesting blend of the very old and the very new. The south of France is one of the most pleasant places on earth, something the Romans found out when they conquered the area (125-121 B.C.), and established a large province connecting Italy and Spain, which they called "Provence," a name which still survives. Montpellier was one of the chief Roman towns in the province, and has played a prominent role ever since. The Roman rule of the area lasted until the end of the 4th century A.D., and although then overthrown by Germanic hoards with terrible destruction, Roman culture nevertheless left its indelible mark which is still present today. For the next four centuries the area saw one conquest after the next, until Charlemagne (768-814)

restored the Roman order. From this time until the present the area of Provence has prospered or suffered along with the rest of France. However, so far as Montpellier is concerned there is one period of great importance and that is the Wars of Religion, with Protestants against Roman Catholics, from 1520-1540. The French themselves describe this period as "the most ghastly in their history," and Montpellier, being a center of Protestantism, suffered badly. However, the scars of this devastation have largely healed, and today Montpellier is a blend of streets with their origins in the middle ages, the elegant 19th century Place de Comedie (the town center) and ultra modern areas, but above all there is the superb old Medical School and the nearby Botanic Garden.

Le Faculté de Médecine  
Rue de l'École de Médecine  
(Off the Boulevard Henri IV)  
Montpellier

The Faculty of Medicine of the University of Montpellier is the oldest surviving medical school in the western world, and was for centuries one of the world leaders. Today it is still one of the foremost in France. One may walk through the public hallways and theaters, but permission from the Dean's office is required to see the restricted rooms and libraries. However, this can be obtained by really interested persons. The main building adjoins the cathedral, which indicates the religious origins of the school, and both can be seen at the same time.

The Faculty of Medicine, and with it the University of Montpellier, was founded on the 17th of August, 1221 by Cardinal Conrad, a papal legate from Pope Urban V, who was at that time the Pope at Avignon. Thus it has been in continuous existence for over 700 years. However, there is every evidence that medicine was studied in Montpellier long before 1221. This was in the Rabbinic schools going back to the 11th century, and the names of some of the professors in these schools are actually preserved and are considered the forerunners of the faculty of medicine.

The building housing the present medical school was originally a monastery, and much of its 13th century walls survive intact. During the religious wars of the 16th century some of this building was destroyed, but in the following two centuries was rebuilt on the same foundations. The great anatomy theater was added in the 19th century. The basement (Salle Lapidaire or Salle Capitulaire) is an original room dating from the 13th century monastery, and the modern electron microscope rests on a 13th century wall!

In a special room of the library are housed an incredible collection of documents concerning the history of the university over its 700 years of existence. One of these dates from 1331, and comes from Philippe VI de Valois, who was the first king of France after Montpellier became part of France; in it he confirms the privileges of the university.

In the central entrance hallway, with its beautiful 18th century staircase, are a collection of busts of the great doctors going back to

Hippocrates (460-357 B.C.), and also plaques showing the names of virtually all the professors of the medical school from the Rabbinic period of the 11th century to the present day.

As the medical school has been in continuous existence for so long one might expect a superb historical library, and indeed this is the case. The office of the Dean is virtually an adjunct to the library, with huge circular stacks containing priceless old books. There are also two magnificent conference rooms (Salle des Actes), one for faculty, and one where graduates receive their degrees. The latter contains portraits of all their famous graduates going back to 1239, and include Francois Rabelais (1490-1553), who received his medical training there in 1537. The original matriculation entry with his signature is actually preserved in the library. It is perhaps significant that unlike many modern medical schools, graduates from Montpellier are still required to take the Hippocratic oath.

It is of great interest that right down to the time of the revolution, virtually all faculty were professors of anatomy in the winter and professors of botany in the summer! One of these, Pierre Richer de Belleval (1558-1623) was the founder of the botanic garden and because of its close association with the medical school, both historically and physically, it is entirely appropriate to say a few words about it.

Le Jardin des Plantes  
Boulevard Henri IV  
Montpellier

Opening Hours - Monday-Friday 8.00-12.00 and 14.50-18.00, Saturdays 8.00-12.00. Closed Sundays. There is no charge for admittance.

The Botanic Garden of Montpellier is one of the oldest in the world, and in Europe is perhaps exceeded in age only by those at Padua (see under Padua, Italy) and Leipzig, East Germany.

Medical schools have always had medicinal herb gardens attached to them, and the evidence is strong that these existed in Montpellier as far back as the origins of the medical school. Indeed, legend has it that Apollo had been wandering as an exile through the south of France, and was so charmed by the pure air, courteous citizens, and abundance of plants at Montpellier, that he decided to found a medical school and herb garden there. However, the present gardens were founded in 1593 as "Le Jardin du Roi" in an edict to the University of Montpellier by King Henri IV (1553-1610). At the same time Pierre Richer de Belleval (1558-1623) was appointed professor of anatomy and botany and director of the garden, with royal patronage. Belleval was one of those rare individuals who went about his job with unparalleled zeal, placing the establishment of the garden above all else. He was always in trouble with both the administration and the students, and for the usual reasons! The administration complained that he did not attend committee meetings or other formal functions, and the students complained that he was never there. No, he was out botanizing, and if it hadn't been for him there would be no botanic garden. We can get some idea of the enthusiasm botanists, then as now, get from botanizing, by quoting a German botanist, Leonard Fuchs, who wrote in 1542:

But there is no reason why I should dilate at greater length upon the pleasantness and delight of acquiring knowledge of plants, since there is no one who does not know that there is nothing in this life pleasanter and more delightful than to wander over woods, mountains, plains, garlanded and adorned with flowerlets and plants of various sorts, and most elegant to boot, and to gaze intently upon them. But it increases that pleasure and delight not a little, if there be added an acquaintance with the virtues and powers of these same plants.

Fortunately, Belleval was more or less immune from the admonitions of administrators and students, for he had the personal patronage of the king. In the years that followed he travelled widely collecting plants, and under his directorship the garden flourished.

In the last decade of the 16th century, Montpellier was emerging from the terrible religious wars of the earlier part of the century. King Henri IV was more or less tolerant of protestant Montpellier, and the university and town were thriving. But in the winter of 1621-1622 disaster struck. The new king, Louis XIII, was not as tolerant of protestants as his predecessor, and decided to bring Montpellier to heel. This he did with a vengeance. His troops actually camped in Belleval's newly established botanic garden and used the buildings for fortifications. It was completely destroyed! When Louis XIII entered the city and peace was restored, Belleval started all over again, and for the remaining years of his life once more put the garden above all else. With ups and downs, the garden has more or less prospered since then, and is still one of the best in the world. One might hope that by now everyone had learned to respect this triumph of scientific botany and beauty, but dangers of the past have not unfortunately disappeared. As recently as 1975, there was a motion put before the Montpellier City Council to turn the botanic garden into a parking lot!

Over the main gate to the garden, and below the king's arms are inscribed the words "Hic Argus Esto et Non Biareus"--Be all eyes, not all hands here! and lovers of plants will appreciate the sentiment. The garden specializes in research on tropical and subtropical plants, and because of the mild climate there is always a good deal in bloom, some of it very exotic. There are both old and new glasshouses, and very interestingly, a whole array of garden sculpture in the form of busts of famous botanists throughout the centuries. In the main administration building, there are extensive research laboratories, and a magnificent botanical library with holdings going back many centuries. The laboratories and library are not normally open to the public, but one may ask (preferably in French!) to see them.

In ending this section on Montpellier, I can only say that the historical fascination of the town and the pleasant climate are exceeded only by the excitement of their medical school and botanic garden.

## PARIS

Paris, the capital of France, is a vast city divided almost equally into two halves by the river Seine, the northern half being referred to as the right bank, and the southern half as the left bank. Paris is the unquestioned center of all French life, social, cultural, political, economic and administrative, and the variety of things to see and do are rivalled only by London. Visitors should avail themselves of good guidebooks and maps, and learn as quickly as possible how to use the excellent public transportation, particularly the underground trains (the Metro), but buses and taxis as well. Parisians have a saying that there are three very good and very cheap things in Paris, bread, wine, and the Metro--make use of them! Nothing however, beats walking to know a city, and Paris is a great city in which to walk. From a scientific point of view, with medicine and biology no exception, Paris has long been the focal point in France and there are many very interesting things to see.

It is appropriate that I start out with a few words of explanation about the University of Paris. Its foundings go back to the 13th century, when Pope Innocent III authorized the incorporation of a group of scholars, and from the very beginning there were various colleges. With the exception of a short period following the revolution, when it was closed by direct order of Napoleon Bonaparte, the university has been in continuous existence ever since, albeit with many changes. Today the University of Paris is a huge complex of semi-autonomous branches scattered all over Paris and its suburbs, but by far the most famous of these is "The Sorbonne."

La Sorbonne  
Place de la Sorbonne  
Paris 5<sup>e</sup>

Opening Hours - Normal weekday hours. There is no charge for admission. Guidebooks etc., are available from the concierge.

Metro - Luxembourg, but Odéon or Maubert-Mutualité will do equally well.

The Sorbonne is on the left bank just off the Boulevard Saint Michel in the heart of the "student-latin quarter." It was founded in 1252 by Robert de Sorbon (1201-1274) who was chaplain to King Louis IX (Saint Louis), and with the consent of the king. From its foundation until the revolution, it was devoted entirely to theology, and was perhaps the greatest center of religious study in Europe. This came to an abrupt end with the revolution, when the Sorbonne was closed and all its property confiscated. However, with the reorganization of the University of Paris in 1808, the Sorbonne was reopened and became the seat of three faculties, literature, science and theology. The present main building, bounded by the Rue Victor Cousin, Rue de la Sorbonne, Rue des Ecoles, Rue Saint Jacques and Rue Cujas dates from 1889. It is a remarkable building, housing lecture halls, museums, laboratories, libraries, offices, an astronomy tower, amphitheaters and a chapel. Here in the nineteenth century many great French scientists worked, but today the Sorbonne is entirely Arts and Letters. It is a great experience to walk through this building with all its historical

associations, but the "pièce de résistance" is Le Grand Amphitheatre (entrance from Rue des Écoles). It may be seen, by permission, if it is not in use.

This amphitheater is of much historical interest to scientists, because it is here that many great ceremonial events have taken place, including the public honoring of Louis Pasteur on the occasion of his 70th birthday in 1892. The amphitheater is in the grand French style. On the domes of the roof are murals of the symbols (all female!) of learning: literature, science, University of Paris, medicine and law. There are also life sized statues of Robert de Sorbon, Descartes, Lavoisier, Rollin, Pascal, Richelieu and others. Finally on the walls of the balcony outside the amphitheater itself are huge murals depicting various events in the history of learning. It is really a very impressive place.

Collège de France  
11 Place Marcelin-Berthelot  
(Off Rue des Écoles)  
Paris 5<sup>e</sup>

Opening Hours - Normal weekday hours. There is no charge for admission.

Metro - Maubert-Mutualité

The Collège de France is the premier academic institution in France. In French academic circles there is a popular saying "first you win the Nobel prize, then you will be elected to the Collège de France!" The college derives from the 17th century Royal College of France, but was founded in its present form in 1732 by Louis XV, and took its present name at the time of the revolution.

The function of the Collège de France is to supply a base for France's top scholars in all academic fields, allowing them the security and freedom to develop a new area of knowledge. The college gives no instruction, and grants no degrees. About the only requirement imposed on its members is that they give a few public lectures a year, and anyone may attend these. Its critics complain that the members become narrow and entrenched, but nevertheless there have been some brilliant scholars who have been members of the Collège de France, including the Egyptologist Jean Champollion (1790-1832), the zoologist Georges Cuvier (1769-1832), the chemist Frédéric Joliot-Curie (1900-1958), the physicist André Ampère (1775-1836), the poet Paul Valéry (1871-1945), and most important for us, the physiologist Claude Bernard (1813-1878).

Outside the entrance to the Collège de France is a life-sized statue of Claude Bernard, whose life and work I will describe under St. Julien-en-Beaujolais. Unfortunately in its prominent position it is subject to almost continuous vandalism! Nothing remains today of the laboratories in which Claude Bernard performed his brilliant work, however on the outside of the wing where he worked (on the Rue des Écoles) is a plaque commemorating his distinguished achievements there.

One may enter the Collège de France, by asking the permission of the concierge. However, visitors should remember that it is an active, working institution. Of particular interest is that in the director's office is a fine collection of instruments, formerly belonging to Claude Bernard, as well as his death mask. These may be seen, by permission, if the director is not disturbed in so doing. In the Collège de France there are also busts, paintings, etc., of Claude Bernard and some of their other distinguished members.

Finally at 40 Rue des Ecoles, directly opposite the Collège de France is the "Claude Bernard House." This is now a private residence, but there is a plaque on the wall indicating that Claude Bernard lived there for many years and also died there on February 10, 1878.

Bibliothèque Saint Geneviève  
10 Place du Pantheon  
Paris 5<sup>e</sup>

Opening Hours - Normal weekday hours. There is no charge for admission. A history of the library and other literature is available at the reception desk.

Metro - Luxembourg, but Cardinal Lemoine will do equally well.

This is the main library of the Sorbonne, and is only a short walk from the latter. Permission is normally granted to see the main reading room, and it is not difficult to obtain a temporary permit to use the library, which contains many medical books of great historic interest.

The origins of the library go back to various religious orders and the founding of the Sorbonne in the 13th century. Until the revolution its holdings were mainly theology, but with the revolution all its holdings were nationalized. The University of Paris was completely reorganized, the scope of the library much enlarged and it now includes the natural sciences.

The present building dates from the middle of the 19th century, and many separate libraries were brought together there. Today it is one of the major libraries of France, with priceless collections going back five centuries. The building itself is an impressive structure. The main reading room is a classic piece of mid-19th century architecture and I recommend a visit to all those interested in academic history. Of interest also in the Place du Panthéon, is the Panthéon, a national shrine, where many of France's great men are buried.

Musée de l'Histoire de la Médecine  
 Faculté de Médecine  
 Université de Paris  
 12 Rue de l'École de Médecine  
 Paris 6<sup>e</sup>

Opening Hours - Wednesday and Friday only, 14.00-18.00. There is no charge for admission.

Metro - Odéon.

This is one of several medical schools within the University of Paris. It is situated just off the Boulevard St. Germain, close to where it crosses the Boulevard St. Michel. It is a huge complex, but from our point of view what is important about it is that on the second and third floors of the main building is a superb historical medical museum. Its name is Musée de l'Histoire de la Médecine, and the "conservateur" is Madam Jacqueline Sonolet (1976). She is also conservateur (curator) of the Musée Claude Bernard in St. Julien-en-Beaujolais (see elsewhere), and is obviously a master of the art. Madame Sonolet prefers to speak French, but in fact she speaks perfect English as well, and will always help out in the latter!

This is a very rich and well organized museum, with displays going back as far as Graeco-Roman times, but with heavy emphasis on the development of French medicine. It has a magnificent collection of prints and drawings going back centuries, and these are of extreme interest historically. There are also artifacts of all kinds. Although the museum is located in an old building, and crowded for space, it is not a static museum. One is brought right up to date with displays of modern instruments for microsurgery, and there are always new displays being arranged.

École Normale Supérieure  
 45 Rue D'Ulm  
 Paris 5<sup>e</sup>

Opening Hours - Normal business hours. There is no charge for admission.

Metro - Port-Royal, but Censier-Daubenton will do just as well.

The École Normale Supérieure is located in the heart of the Latin-Student Quarter, not far from the Sorbonne. Today this is the top educational institution in France and from an academic standpoint very elite. Only 55 students, carefully chosen from all over France, are admitted each year, and for 4 years they receive intensive training to get their degree. The institution also awards doctorate degrees, and there are extensive facilities for research particularly in the sciences. From an historical point of view, of great interest is that Louis Pasteur (see under Arbois and Dole) was the Director here from 1857-1867, and here also he performed some of his classic experiments.

This educational institution was founded in 1794 by "The Convention" at the time of the revolution. Its initial function was to train teachers for



French schools, but it has gradually evolved into its present elite status. It has stood on its present site since 1847, though the buildings have been vastly expanded over the years.

The building of historical interest is at 45 Rue D'Ulm, and one enters through iron gates, behind which is a portico and the office of the concierge, and beyond this is a large courtyard in the form of a handsome garden. On the four walls surrounding the courtyard are busts of many famous Frenchmen, including Ampère, Lavoisier, Guy-Lussac, Cuvier, Descartes, Molière, Racine, Lafontaine, Voltaire, etc.--all very impressive, and even more so when it is realized that Louis Pasteur must have spent many hours in these same surroundings contemplating his next experiments.

However, "the gem" from a biologist's point of view is a small building just inside and to the right of the main gates. On the outside is a plaque which reads as follows:

Le Laboratoire de Pasteur  
installé dans un grenier en 1857  
fut établi dans ce pavillon en 1860  
et agrandi de bâtiments voisins  
de 1862-1869.

(The laboratory of Pasteur installed in a granary in 1857,  
was established in this pavilion in 1860, and enlarged by  
adding the adjoining buildings from 1862-1869.)

This in fact is where Pasteur performed some of his classic experiments. The building is now used as an infirmary for the school, and the Matron lives there. However with special permission, and if the Matron is not too busy, she will take you up to the second floor (1<sup>e</sup> étage) and show you the little attic cupboard (so small he had to work on his knees!) which Pasteur used as a culture room for his flasks. It was here that he did the experiments to disprove the "spontaneous generation of life." There is a plaque outside the room commemorating the event, and the room is now used to store children's toys. Pasteur would have been happy about this. It gives one a great sense of respect, even humility to see the simple place where this great man worked and transformed so many aspects of our lives.

École Supérieure de Physique  
et de Chimie Industrielles de la Ville de Paris  
10 Rue Vanquelin  
Paris 5<sup>e</sup>

Opening Hours - Normal business hours. There is no charge for admission.

Metro - Censier-Daubenton, but Port Royal or Place Monge will do just as well.

This educational institution is situated right next to the École Normale Supérieure. It is not of direct medical or biological importance, but rather of physics and chemistry, for it was here in 1898 that Pierre and Marie Curie

discovered the element radium and coined the word "radioactivity." There are a few things here which survive from this great and far-reaching event, and because of its importance to medicine and indeed all biology, I want to say a few words about this institution and the husband and wife who made such a momentous discovery here.

Marie Curie (1867-1934) was born Marya Sklodowska in Warsaw, Poland, and from her earliest days she was recognized as a bright and enthusiastic student. Despite her parents genuine concern for education, she received a very mediocre formal education, but was an avid reader and was largely self educated. Because of poverty within her family, and in order to educate her brothers and sisters, she went to work as a governess and remained in this capacity for some years. In 1891 at the age of 24, she left Poland and travelled to Paris. Then as now (!) Poland was under the domination of Russia, and to Marie, France was the land of liberty and opportunity. Her dreams were, in this case to be fulfilled. Upon arriving in Paris, she immediately resumed her education, and in 1893 received a degree in physics and mathematics from the University of Paris, ranking first in her class. The following year, while looking for a doctoral problem, she met Pierre Curie (1859-1906) at the École de Physique et Chimie where he was a professor, and went to work under him. They were married in 1895.

In the last decade of the 19th century, events were moving quickly in physics. In 1896, Henri Becquerel (1852-1908)--see under Musée National d'Histoire Naturelle, Paris--had discovered and published his observations on the radio-activity of uranium, and these rays subsequently became known as Becquerel Rays. In 1898, just 3 years after Marie went to work in Pierre's laboratory, they both isolated, for the first time, the highly radioactive element radium. In 1903 Marie received her somewhat delayed doctorate degree, and the same year, she, her husband and Henri Becquerel were awarded the Nobel prize for their work. As a result of their research a new era in physics and chemistry was opened, which has had profound consequences for us all. With the discovery of radioactivity and radium in particular, Marie firmly believed that she and her coworkers had found at last the ever-elusive "cure for cancer." Unfortunately, this did not prove to be the case, though of course it has been of great value in controlling some aspects of the disease.

Up until this time, life had been hard for the Curies, but they were a happy couple and enjoyed a simple life. In 1906 Marie was made a professor at the Sorbonne, the first woman to hold such a post, but in the same year disaster struck with the death of her husband, who was run over by a dray in the streets of Paris. Marie never really recovered from this, and her only compensation was to immerse herself in work. Her brilliant mind continued to unravel the mysteries of radioactivity and in 1911 she was awarded the Nobel prize for the second time. Honors and fame poured in for her, but she continued a quiet life and increasingly devoted her skills to medical applications of radiology. The harmful effects of radioactivity (unknown then), to which she was continuously exposed, took its toll on her health and she gradually became unable to work effectively. She died in a sanatorium in 1934. Marie was a remarkable human being, and her name will live on, perpetuated in "the curie," now the physical unit of radioactivity. One short epilogue, Marie and Pierre's daughter, Irène, who became the wife of

the French physicist Frédéric Joliot, also won the Nobel prize in 1935, a year after her mother's death.

Unfortunately the laboratory of Pierre and Marie Curie at the École Supérieure de Physique et de Chimie does not survive, but the portico to the original institution does, and outside there is a plaque commemorating their discovery. However, in a hallway outside the director's office (which can be seen by permission) is a case containing some of the Curie's original apparatus and instruments. Also some of their own notes and published articles. To see these is well worth the effort, but it is a pity that more is not preserved of this momentous discovery.

Muséum National d'Histoire Naturelle-Jardin des Plantes  
Place Valhubert/Rue Cuvier/Rue Geoffroy St. Hilaire  
Paris 5<sup>e</sup>

Opening Hours - Seven days a week from 7.00-8.00 (depending on the season) until 10 minutes before sunset. Various buildings are open at different times, but all are closed on Tuesdays. There is no charge for admission, and a general guidebook is available.

Metro - Austerlitz (which is the same as Gare d'Orléans). This is for the main entrance on Place Valhubert, but Censier-Daubenton, Place Monge and Jussieu are all within easy walking distance of other entrances.

This massive institution is the principle Natural History Complex of France, and it occupies a whole block facing onto the Seine along the Quai Saint Bernard and opposite the Pont d'Austerlitz. It was founded in 1635 as "Le Jardin Royal," and initially was the Royal Medicinal Herb Garden of Louis XIII. However, under Louis XIV (1638-1715) it underwent great expansion both in size and functions. Botanists were sent out all over the world to collect plants and bring them back to Le Jardin Royal. Animals were also included in the collections, and geological specimens as well. In this way, a thriving institution of scientific botany, zoology and geology was established, and has more or less prospered ever since. With the coming of the revolution, Le Jardin Royal received a new charter and was renamed Le Muséum National d'Histoire Naturelle. Today its operation comes under the ultimate authority of the Minister of Education, and its functions are collecting, research and education, not just in natural history, but in all the natural sciences. Many great scientists have worked here at one time or another.

In English-speaking countries we tend to emphasize the achievements of our own compatriots, and forget that the French (and other peoples) had their counterparts who made enormous contributions to human knowledge. For example Le Comte George Louis de Buffon (1708-1788), Le Chevalier Jean Baptiste de Lamarck (1744-1829), Georges Cuvier (1769-1832) and Henri Becquerel (1852-1908), all worked at Le Muséum National d'Histoire Naturelle. Medicine per se has not been the main function of this museum, but two of the above mentioned have played such an enormous role in its development that a few words about them are in order.

Jean Baptiste Lamarck is probably the most maligned scientist in the English-speaking world. Professors of genetics commonly mention his name in an introductory lecture and then proceed to trample him underfoot and tell their students "never let me hear you mention his name." However, that is a very short-sighted and totally false view of Lamarck, who in my opinion was second only to Darwin as a biological scientist. The French tend to put him above Darwin! He was born in the small village of Bazentine-le-Petit in northeastern France. His family is described as minor nobility without wealth, and the latter certainly characterizes Lamarck's life, for he was always poor, and at his death there was not even enough money to pay for his funeral. As a boy he studied under the Jesuits in Amiens, but this did not last long, and at the early age of 15 he joined the French Army. He saw active service, travelled widely, and most important of all, for his future career, began botanizing. After some 10 years in the army he was forced by ill health to leave, and found his way to Paris where he studied medicine. As a result of his botanical knowledge he was soon elected to the Academy of Sciences, and in 1788 was also appointed to the staff of Le Jardin du Roi. Lamarck took an active role in the reorganization of this at the time of the revolution, and when it subsequently became Le Muséum National d'Histoire Naturelle, he remained with it for the rest of his life and there he did all his important work. Lamarck's private life can only be described as tragic. He married three times, each wife dying early in life, and he could never properly support his many children. Tragically also, he went completely blind for the last 10 years of his life.

Lamarck's scientific works covered a wide range of knowledge of chemistry, meteorology and geology. Most important was the fact that he also tried to grasp the underlying principles of each discipline and did not concern himself with minor details. His fame rests on his magnificent botanical and zoological works, and above all on his clearly stated theory of evolution. His *Flore Francaise*, published in 3 volumes in 1779, not only described accurately all the then known French plants, but introduced a system of natural classification much better than that of Carl Linnaeus, and this classification probably set his mind to work on his eventual theory of evolution. He did much the same thing with invertebrate animals, and his finds were published in two major works, *Système des animaux sans vertèbres* (1801) and his seven volume work, *Histoire naturelle des animaux sans vertèbres* (1815-1822). It was in these that he also first discussed his theory of evolution, and also *Philosophe zoologique* (1809). Lamarck's ideas on evolution are complex and scattered throughout his books, but there can be no doubt that he came to believe in the gradual development through time of animals and plants evolving from pre-existing ones. The great problem in his mind was "how." He proposed the theory that the environment acted on living things in such a way as to change their characteristics making them more adaptable to that environment, and that these newly developed characteristics were then inherited by the offspring. This theory of Lamarck's, commonly referred to as "the inheritance of acquired characteristics," has subsequently proven to be incorrect, and a much better explanation was to be given by Charles Darwin. As a result Lamarck's reputation has suffered badly, and he has even been ridiculed in scientific circles. This, in my opinion, is most unjust. His contributions to general biological thought and knowledge were enormous, and he supplied the first clearly stated theory of evolution. He died unheralded in Paris in 1829, two years before Charles

Darwin was to sail on the voyage of the Beagle. However, today he is not forgotten in French scientific circles, and just inside the main entrance of the museum, and dominating the whole scene is a very lovely statue of Jean Baptiste Lamarck, and this "sets the tone" for the whole institution. Below Lamarck's name on the statue are inscribed the following words:

Au  
Fondateur de la Doctrine  
de l'Evolution  
Subscription Universelle  
1908

Although I am myself a Darwinian scholar, I agree with the French, Lamarck was the founder of the doctrine of evolution. It is not generally known that he also played a major role in the formulation and elucidation of the cell theory.

Henri Becquerel also worked in the museum. He was born in 1852 within the grounds of Le Muséum National d'Histoire Naturelle, where his father was a professor of physics, as was his grandfather also. Thus he was born and brought up in a scientific environment. He had the best schooling Paris could offer, receiving an engineering degree in 1877. He subsequently held high rank in the French civil service, as well as research and teaching appointments at various scientific schools and at Le Muséum National d'Histoire Naturelle.

Becquerel's life was by no means entirely devoted to research in physics, but in 1896 he made the remarkable discovery of ionizing radiation from the element uranium, and thus opened the way for the modern science of nuclear physics. He subsequently worked closely with Pierre and Marie Curie (see elsewhere) with whom he shared the Nobel prize in 1903. The importance of Becquerel's discovery of radioactivity (a word coined by Marie Curie), can hardly be overestimated for its influence not only on physics, but also on biology and medicine, and it was here at Le Muséum where the discovery took place. He died in Brittany in 1908. In a building bordering the Rue Cuvier, Becquerel had his laboratory and outside his a plaque with the inscription:

Dans le Laboratoire  
de Physique Appliqué du Muséum  
Henri Becquerel  
a Découvert la Radioactivité  
le 1<sup>er</sup> Mars 1896

For better or worse the world has never been the same since.

There are many other places of great historical interest within the grounds of the museum, but I just want to mention one more and it is the magnificent library, La Bibliothèque de Muséum National d'Histoire Naturelle. It is located next to the zoological galleries bordering la Rue Geoffroy St. Hilaire. This is a modern building complex, and it houses one of the best biological science collections in the world, with priceless holdings going back centuries. Application to use the library may be made at the main desk, and it is not difficult to obtain. The stacks are not open to the public except with very special permission of the chief librarian, but a professional librarian will bring anything to the reading room upon request.

The card index is easy to use. I can mention also that as one enters the main lobby of the building, there are on either side, larger than life murals depicting with freshness and clarity the world's great naturalists and explorers, by the artist Raoul Dufy (1878-1953).

In conclusion, I will say that Le Muséum National d'Histoire Naturelle is full of scientific history and a wonderful place to spend an hour, a day or a week!

Académie National des Sciences  
Place de l'Institut  
23 Quai de Conti  
Paris 6<sup>e</sup>

Opening Hours - Normal business hours. There is no charge for admission.

Metro - Pont Neuf

This is also known as the Institut de France, and is the senior scientific body of the country. It is the equivalent of the Royal Society in England, or the National Academy of Sciences in the United States. It is located on the left bank opposite Le Pont des Arts. The buildings in which L'Académie National des Sciences are housed are not generally open to the public, however, one may ask the permission of the concierge to look around or be shown around. As is somewhat typical of French institutions of this type, the buildings are spacious, elaborately decorated, and there are a quantity of busts and portraits of famous French scientists. An interesting scientific place steeped in history.

Académie de Médecine  
16 Rue Bonaparte  
Paris 6<sup>e</sup>

Opening Hours - Normal business hours. There is no charge for admission.

Metro - St. Germain des Prés.

This is the senior medical institute of France, with a long history. It is on the left bank, just around the corner from La Place de l'Institut. Once again this is not really open to the public, but permission to see around may be obtained from the concierge. It is a very impressive building. Of particular interest are the three main meeting rooms, La Grand Salle for general assemblies, Le Petit Salle for conferences, and La Salle Bader in which there are busts of virtually all the great French doctors throughout history. There are many more busts and portraits in the lobbies and hallways.

However, by far the most valuable asset of L'Académie de Médecine is their superb and priceless medical library. The library is scattered throughout the whole building, but there is a central reception and reading area. Permission for qualified scholars to use the library is relatively

easy to obtain (unusual in France). However, the librarian is very cooperative and will produce almost any medical book of historical significance upon request. I asked to see the first edition (1543) of Vesalius' Anatomy, and it was produced within minutes! It is a very lovely experience to see "the home" of French medicine.

Faculté de Médecine  
Université de Paris  
45 Rue Saints Peres  
Paris 6<sup>e</sup>

Opening Hours - Tuesdays and Fridays only, 14.30-17.00. There is no charge for admission.

Metro - St. Germain des Prés.

This is one of several faculties of medicine of the University of Paris, but it is of special interest in that it has two superb medical museums, which are called Le Musée Orfila and Le Musée Rouvière. To see these one must be accompanied by an attendant, and permission to enter has to be obtained at the office on the 6<sup>e</sup> étage (7th floor). The museums themselves are on the 8<sup>e</sup> étage (9th floor). Some background of medical and biological knowledge is necessary to appreciate them, and they are not suitable for children.

Le Musée Orfila is primarily comparative anatomy, and a marvelous place to see the anatomical evolutionary development of animals. Le Musée Rouvière is devoted to human anatomy. The displays are extensive, beautifully dissected, and comprise whole cadavers, skeletons, skulls, muscles, internal organs, sense organs, etc. There are also casts of the brains of former professors! These two museums are of great interest and value to the biologically and medically oriented.

Musée Fauchard et Bibliothèque  
Ecole Dentaire de Paris  
45 Rue de la Tour d'Auvergne  
Paris 9<sup>e</sup>

Opening Hours - Monday to Thursday only, 9.30-12.00 and 14.30-17.00.

Books etc., on the history of dentistry are available. There is no charge for admission.

Metro - St. Georges

This is one of two dental schools in the University of Paris, but this one is of particular interest for its superb dental museum and library. The museum and library are named after the great French dentist Pierre Fauchard (1678-1761), who is universally acclaimed as the "Father of Dentistry." Almost everyone has suffered from some problems of the teeth, but without the pioneer work of Pierre Fauchard the modern dentist would not have come into being, and thus all mankind owes him a debt of gratitude. Considering the

importance of Pierre Fauchard in the history of dentistry, it is remarkable so little is known about his life. He was born in Brittany in 1678. We know nothing about his education, except that he indicates most of it was self education, and certainly he had no formal training in dentistry. He became the "leading dentist of Paris," and died there in 1761 at the age of 83.

In 1728 he published his major work in two volumes. Amazingly enough the original manuscript survives! The title of the work is long, but is important because it indicates the thoroughness and comprehensiveness of the book. In English translation it reads: "The Surgeon Dentist or Treatise on the Teeth: In which it is seen the means used to keep them clean and healthy, of beautifying them, of repairing their loss and remedies for their diseases and those of the gums and for accidents which may befall the other parts in their vicinity--with observations and reflections on several special cases. A work enhanced by forty-two illustrations." There can be no doubt that this is the first scientific work on dentistry, and from it the modern science derives. In the preface, Fauchard gives credit to his predecessors, but they are really insignificant compared to his own genius. The title of the work indicates its scope, but its novelities have become part and parcel of modern dentistry. For example, he was the first to use and describe metal bands for correcting irregularities of the teeth, and he also used antiseptic methods in filling teeth long before the germ theory of infection was put forth. The illustrations of the instruments he developed and used, are not unlike those in a dentist's tray of today.

Pierre Fauchard's ideas and methods spread far and wide, and they were adopted particularly rapidly in the newer, less traditional societies like the United States. Indeed, the United States' pre-eminence in modern dentistry derives from Pierre Fauchard.

The Museum and Historical Library of the Dental School are under the care of Mlle Ghislaine de la Riviere, who is very knowledgeable and cooperative. The library is priceless and holds virtually every major work in the history of dentistry. Some of its very special books are displayed under glass. Permission to use the library is granted only to qualified scholars. The main room of the museum is surrounded on all four walls by display cases devoted to the history of dentistry. Unfortunately the displays comprise only a fraction of their collection, which is mostly stored in crates due to lack of space. However, the displays are fascinating and comprise such things as comparative dental anatomy of extinct and living animals, and a prized possession of a case of early 19th century dental instruments made for the dentist of King Charles X. This huge set of instruments is decorated in "mother of pearl," and a real gem to see. There is of course much more, and this is a very special place for those concerned with the history of dentistry.



Bibliothèque National  
58 Rue Richelieu  
Paris 2<sup>e</sup>

Opening Hours - Seven days a week 9.00-18.00, but opening hours of special departments vary considerably. Pamphlets on the history and nature of the library are available. There is no charge for admission.

Metro - Bourse

This is the national library of France, comparable to the British Library in Britain or the Library of Congress in the United States. One must have permission to use the library, but it is not difficult to obtain.

La Bibliothèque National has a long and complicated history, which it is not pertinent to describe in detail here. Briefly its origins go back to the 14th century when it was founded by King Charles V in La Tour de Louvre. However, in the following century King Charles VIII and Louis XII moved it to Le Château d'Amboise in the valley of the Loire. This was one of many royal castles in the area, and the library remained there for over a century. However in the 16th century, it was moved back to Paris and has remained there ever since. In 1537 Francis I signed a copyright law, granting the National Library a "duty copy" of every book published in France.

Over the centuries it has grown enormously, and is now one of the major libraries of the world and the depository of many major scientific works, such as all the 138 notebooks and correspondence of Louis Pasteur.

The architecture of the library is truly beautiful, and one may ask permission to see La Grand Salle and other major rooms. In addition there are Les Galeries Mansart et Mazarine, where there are often special exhibits. One cannot fail to enjoy a visit to this great library.

Musée Pasteur  
Institut Pasteur  
25 Rue du Docteur Roux  
(Off Boulevard Pasteur)  
Paris 15<sup>e</sup>

Opening Hours - Monday-Friday 9.30-12.00 and 14.30-17.00. Books and other literature are available. There is also a guide, but she speaks French only. There is a small charge for admission.

Metro - Pasteur

The Pasteur Institute is now made up of many buildings devoted to biological research, but the original building with its museum, was constructed by the French government in honor of Pasteur during his lifetime (for a short biography of Pasteur see under Arbois). During its construction, there was an apartment built right into it as living quarters for Pasteur and his wife. Today this comprises the Pasteur museum, and in most of the rooms things have been left much as he and his wife would have known them.

From a scientist's point of view, perhaps the most interesting room is "La Salle de Souvenirs Scientifiques." Beautifully displayed here, are most of the brilliant experiments and achievements of Pasteur. In looking at these, it should be remembered that Pasteur was primarily a physicist and chemist, and applied this knowledge to biology. He was never a medical doctor, yet no one ever did more for medicine. Much of the equipment in these displays was originally used by Pasteur, and a lot of it was made with his own hands.

The rest of the museum comprises seven rooms, showing the private living quarters of Pasteur and his wife. All their original furniture is there, and many of the walls are adorned with the paintings of Pasteur himself, who was a skilled artist. Also in La Grand Salle à Manger (the dining room) there is a magnificent portrait of the Italian biologist, Lazzaro-Spallanzani (1729-1799), whom Pasteur greatly admired.

In the basement of the institute is the room in which Pasteur and his wife are buried. This is open to the public upon request at the museum desk. At the time of his death (1895) there was much pressure to have him buried in the Panthéon along with other great Frenchmen, though his family wanted him buried in his home environment at Arbois or Dole. However, his scientific friends and colleagues pressed to have him buried in the Institut Pasteur, and their wishes finally prevailed. The crypt containing their tomb is really very beautiful, and is decorated in mosaic tiles. On the walls is a summary of his life's work, and in translation reads as follows:

1848 Molecular Disscymetrie  
 1857 Fermentations  
 1862 Spontaneous generation  
 1863 Studies in wine  
 1865 Maladies of silkworms  
 1871 Studies on beer  
 1877 Studies of virulent maladies  
 1880 Attenuation of viruses-vaccines  
 1885 Prophylaxis of rabies

On the ceiling at the four corners are the words foi (faith), esperance (hope), charité (charity), science (science), and these well express the criteria by which Pasteur lived his life.

Finally in the Institut Pasteur is the very impressive main library, which Pasteur himself used. It is particularly nice to see here that many of Pasteur's collaborators, including Charles Chamberland (1851-1908) and Emile Roux (1853-1933), are not forgotten in the great achievements of thier master.

All in all a visit to the Institut Pasteur is a very interesting educational and moving experience. All done in excellent taste, and superbly kept and managed.

Le Conservatoire National des Arts et Métiers  
292 Rue Saint-Martin  
Paris 3<sup>e</sup>

Opening Hours - Tuesday-Friday 14.00-17.30. Saturdays 9.00-16.30.  
Sundays 14.00-17.30. Closed Mondays. Literature is available. There is no charge for admission.

Metro - Reaumur-Sebastopol

This is France's National Museum of arts and technology. Its origins go back to the revolution in 1794, when it was founded by public order of "The Convention." It preserves and displays the historical development of the graphic arts, photography, electricity and electronics, industrial machines, physical instruments, astronomy, etc. It is not primarily concerned with biology, but in this regard it has a fine display of the apparatus and instruments belonging to Antoine Laurent Lavoisier (1743-1794). Although a chemist by profession, Lavoisier's contribution to biology cannot be overestimated, mainly from his discovery of the true nature of combustion, and his application of chemistry to biology. With the publication of his *Traité Élémentaire de Chimie* in 1789, modern chemistry is said to have begun, and its influence on modern biology was not long delayed.

Included in the Lavoisier Collection at the museum are his desk, balances, thermometers, calorimeters, etc. These alone are worth a visit, but there is much more to delight anyone interested in the history of science and technology.

Le Hôtel Dieu  
Place du Parvis  
Ile de la Cité  
Paris 4<sup>e</sup>

Opening Hours - Normal business hours.

Metro - Le Cité

The Hôtel Dieu is on the main island (Ile de la Cité) in the Seine river, and borders the same square (Place du Parvis) as Notre Dame Cathedral.

This is one of the oldest hospitals in Europe, having been founded in 660 by St. Landry, the Bishop of Paris. It has been destroyed and rebuilt many times since then, but the original site was just across the square where the statue of Charlemagne now stands. Today it is a modern and active hospital, but visitors are welcome to walk in the central courtyard, and around the porticos, where there are large murals and photographs depicting the development and important events in the history of medicine and the hospital.

Cimetière du Père-Lachaise  
Boulevard Ménilmontant  
Paris 20<sup>e</sup>

Opening Hours - Seven days a week from 9.00 to dusk. There is no charge for admission.

Le Bureau de Conservation near the entrance will locate the grave of anyone buried there.

Metro - Père-Lachaise

It is fitting that this section on Paris should end with its famous cemetery Père-Lachaise. It is a beautiful cemetery and a pleasure to walk in it, but what is so remarkable about it is the number of very famous people, including many scientists, who are buried there. A few of these are Rossine, Colette, Heloise and Abélard, Frédéric Chopin, Champollion, Daumier, Molière, Gay-Lussac, Beaumarchais, Marshal Ney, Sarah Bernhardt, Balzac, Delacroix, Bizet, Proust, Isidora Duncan, Oscar Wilde, and to the great interest of all physiologists and medical doctors, Claude Bernard (see under St. Julien-en-Beaujolais). The location of Claude Bernard's grave is Division 20, Line 8, Number 18, but even then it takes a little effort to find it. However, it is worth it just to see the resting place of this great man to whom we owe so much. It is a simple grave, and on the tombstone are carved the following words--in translation.

Claude Bernard  
Member of the Institute  
Academy of Sciences and French Academy  
Professor at the College of France  
and at the Natural History Museum  
Honorary Professor at the Faculty of Sciences  
Member of the Academy of Medicine  
President of the Society of Biology  
Former Senator  
Commander of the Legion of Honor  
Born at St. Julien (Rhône) 11th July 1813  
Died at Paris 10th February 1878.

ST. JULIEN-EN-BEAUJOLAIS (Rhône)

Location - 440 kilometers south of Paris

Train - Paris (Gare de Lyon) to Lyon, and then by bus or taxi to St. Julien-en-Beaujolais.

Road - Take the A6 (la Route du Sud) towards Lyon. About 30 kilometers north of Lyon turn off to Villefranche-sur-Saone. Then take the D35 (la Route du Beaujolais) to the west and to Saint Julien sur/sous Montmelas--also called St. Julien-en-Beaujolais.

St. Julien-en-Beaujolais, Rhône, is a small village in the heart of the Beaujolais wine area, but is also noted for the fact that it was here in 1813 that Claude Bernard (see also under Paris) was born. Today there is a very fine museum here of recent origin, kept in his honor.

Le Musée Claude Bernard  
Route D76  
St. Julien-en-Beaujolais

Opening Hours - Tuesday-Sunday 10.00-12.00 and 14.00-18.00. Closed Mondays, and for the month of March. There is a small charge for admission, and guidebooks and other literature are available. The museum is owned and operated by La Fondation Merieux, Lyon.

Claude Bernard (1813-1878), is universally regarded as the founder of experimental physiology, a method of research which, since his time has given rise to untold insights and discoveries about living phenomena. He was the son of poor vineyard workers in Beaujolais, and received a very sparse education, with no science at all, but he loved all natural things, and had an inquiring mind. As a young man he worked under an apothecary, but soon turned his talents to the theater, writing comedies. These were successful enough, that he was soon in Paris, but there he was dissuaded from pursuing a literary career. Instead he studied medicine, and for a time interned at the Hôtel Dieu (see under Paris) under the most famous physician of the day, Françoise Magendie. In 1841, at the age of 28, he followed Magendie to the Collège de France (see under Paris). Magendie was an experimenter, and from him Claude Bernard learned the concepts and techniques which he was to put to such great use.

In the meantime he married in haste, and it is said for money, the daughter of a Parisian physician, Fanny Martin. This unfortunately turned out to be a classic case of the lines by William Congreve (1670-1729) "Marry'd in haste, we repent at leisure," for he had a miserable conjugal life.

In 1852, Magendie retired, and Claude Bernard succeeded to his chair at the Collège de France, and for the next twenty years he made one brilliant discovery after the next, making his name a legend. It has often been said, that had Nobel prizes been awarded in Claude Bernard's day, that he would have won several. His accomplishments and discoveries include:

1. The digestive function of the pancreas.
2. The glycogenic and other functions of the liver.
3. The discovery of the vasoconstrictor and vasodilator nerves and their mechanisms of functioning.
4. The concept of the "milieu interieur" (internal environment), now referred to as homeostasis.
5. His studies on the action of drugs, particularly curare, and their application to medicine.
6. The functions of bile.
7. Nerve innervation of the vocal chords, and the functions of the cranial nerves.
8. The inhibitory action of the vagus nerve on the heart.
9. The production of experimental diabetes. In fact, he only just missed discovering the cause of diabetes.

However, more than all this was his establishment of experimental physiology as a valuable tool to the understanding of how living things work. As he himself put it "La source unique de nos connaissances est l'experimentation" (Experimentation is a unique source of knowledge.) His great work "Introduction à l'Étude de la Médecine Expérimentale" published in 1865 is one of the milestones in physiology and medicine.

Throughout his life, whenever his duties in Paris would permit, Claude Bernard returned to his home in St. Julien-en-Beaujolais. In due course he bought the manor house and vineyards where his parents had worked, and he was himself an avid viticulturist. His later years were plagued by illness, but were happier in the sense that he was separated from his wife. He died in Paris in 1878 and was accorded a state funeral, hitherto reserved for famous politicians and generals.

Le Musée Claude Bernard is in the house which he bought and so often returned to. It is located just in front of the house where he was born "La Maison Natale," and there is a plaque on this commemorating the event. All the rooms on the ground and 1<sup>e</sup> estage (second floor) of the museum are devoted to the life history and achievements of Claude Bernard. It consists of various exhibits of his famous laboratory experiments, his instruments, kymographs, balances, documents, etc., his M.D. thesis, and all his published works in their original editions. Much of the furniture in the rooms is original. There are also many portraits, busts and photographs, and events from his private life. Copies of his theatrical works, such as "La Rose du Rhône" and others, also an autographed copy of Emile Zola's famous novel "Le Docteur Pascal," which was based on the life of Claude Bernard. There are many other things to see there, and in my opinion it is "a gem."

The museum house, built of soft yellow stone, is set in beautiful countryside, and surrounded by the same vineyards which Claude Bernard cultivated.

This is a pleasant place to close my dialogue on the biological and medical history of France. However, before leaving the Beaujolais area, I would like to suggest that you drive around it on "La Route des Beaujolais Villages," and perhaps end up with a meal at Le Restaurant du Beaujolais (closed Tuesdays) in the little village of Blaceret, just 5 kilometers north of St. Julien-en-Beaujolais. It is a guide Michelin one star restaurant, and a fitting place to celebrate the life of Claude Bernard and the blessings we owe to him.