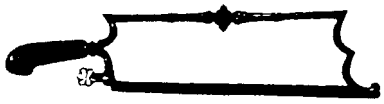
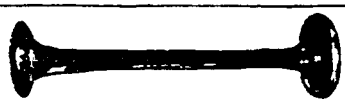
MEDICAL



COLLECTORS



ASSOCIATION

NEWSLETTER NO. 12
February 1988

Dear Colleagues:

We have once again arrived at the start of a new year and it is remarkable to me that this is actually the fifth year of the existence of the Medical Collectors Association. The vast majority of members have already renewed their membership for this year and renewals are being received daily. We have sent out one final reminder, which was somewhat late this year because of some logistic difficulties. For that reason, I have decided to mail the first Newsletter of 1988 to everyone regardless of whether or not they have renewed their membership. However, persons who do not subsequently renew their membership will not be able to attend the meeting in Chapel Hill and will not receive any other Newsletters or reminders about dues.

The most important information at the present time concerns the planned meeting in Chapel Hill. You will find attached to this Newsletter, a form to fill out for attendance at the meeting, as well as the finalized program. People who are registering at this point may include their banquet fee along with the registration fee, if they wish to attend the banquet. Those individuals who have already registered but have not yet paid for the banquet, should forward the banquet fee to Larry Vincent. The approximate number of guests has to be provided to the Inn four weeks prior to the event so everyone should try to sign up as early as possible.

Larry has done a spectacular job in making arrangements for the meeting and furthermore he has offered to be a host to the next meeting in Washington (State). It is possible that he may not be able to attend the meeting in Chapel Hill because of his relocation, and so I think we all owe him a major debt for his efforts.

At the current time we have three possible sites for the next meeting, Jeremy Norman has agreed to help us if we choose San Francisco, Larry Vincent will help us for Washington, and Olgierd Lindan has volunteered for Cleveland. We will plan to discuss the dates and site of the next meeting at the time that we get together in Chapel Hill.

Once again, thanks to the graciousness of members and people of related interests, I am enclosing with this Newsletter a large number of flyers containing important information. Jeremy Norman has begun to publish a Newsletter which contains material of significant interest to the Medical Collectors Association, and a copy of the Newsletter is included. In addition, there are announcements about a couple of meetings which are in our interest, and a museum which has a very nice and interesting collection. The College of Physicians at Philadelphia is having a conference on the History of Disease on Friday and Saturday, March 11th and 12th, which promises to be most interesting. Information about this conference can be obtained from the College of Physicians of Philadelphia, 19 South 22nd Street, Philadelphia, PA 19103. Unfortunately, they did not have enough brochures for me

Mailing Address: M. Donald Blaufox, M.D., Ph.D. • 1300 Morris Park Avenue • Bronx, New York 10461 • (212) 904-4011

to be able to include their announcement, as well as some of the others.

Henry Gloetzner has written, asking if it would be possible to have an "Information Please" column in which members dealing with establishing a small hospital museum could circulate information. He has been trying to develop a museum for a number of years and has a number of problems he would like to discuss with some individuals. I would be delighted to publish any queries or recommendations in this area, if you just forward them to me for inclusion in the next or ensuing Newsletters.

Douglas Johnston writes that he would like to see a "Question and Answer" section, in which we could send in questions about instruments and have them answered by a dealer or authority. In reality, this is what the "Can You Identify This?" column was meant to be, however, there has been little participation by the membership. If anyone has any instruments or items that they want identified or discussed, I would be delighted to serve as an intermediary and arrange to have this in the Newsletter. It would be most useful if this could be accompanied by a good black and white photograph or a line drawing.

In anticipation of Dr. Johnston's suggestion, I have included with this letter a query from Terry Hambrecht about an article he is researching on Dr. Julian Chisolm. If anyone has any information about Dr. Chisholm's inhaler or the physician himself, please write to Terry at the address shown on the drawing.

Dr. Johnston also raises the question of having a section where collectors could sell their extra or unwanted instruments to other collectors. I believe that the "Wants" column is meant to serve this purpose, but if someone wishes to announce the availability of some particular device, I think that they should do it through identifying those individuals who appear to have interests in that area as shown by the "Wants" column. Virtually every aspect of collecting is represented by the various collectors' wants. I have advertised my interest in blood pressure devices in every issue of the Newsletter and have had virtually no response to that. I believe that if we are going to make maximum benefit out of the Association, we should more actively utilize these Wants columns and the Newsletter as a vehicle for more communication. I have been very pleasantly surprised by the great success with which the meetings have grown and the increasing willingness of other members to organize and supervise our getting together once a year.

This issue of the Newsletter once again contains an interesting contribution to the Medical Museums of the World from Professor Pengelley. This time we travel the United States. A few people appear to have misplaced Professor Pengelley's address and are interested in obtaining his travel guide. For those of you who don't have it handy, you can obtain Professor Pengelley's book on Medical Museums of the World by writing to him at: Dept. of Zoology, Storer Hall, University of California, Davis, CA 95616.

In response to the last Newsletter, Norm Medow sent me a back plaster which is currently manufactured by Johnson & Johnson. A photocopy of the container is included with this Newsletter. He wanted to point out that the use of plasters persists, and although many of us tend to think of them as rather antiquated forms of therapy, I think they are going to be with us for many years to come.

Dr. G.J. Frishmuth has sent in a device for identification in the "Can You Identify This" column. Anyone who knows specifically what this is and its use should write both to Dr. Frishmuth and me so that I can publish the answer in the next Newsletter and Dr. Frishmuth will be properly informed.

Dr. Richard Wagner, in response to my little article about leeches, has sent us a similar article from the CHARLESTON TIMES COURIER dated Dec. 9, 1987.

We are, beginning with this issue, courtesy of VIM & VIGOR MAGAZINE and Dr. Robert E. Kravetz, a new column. Dr. Kravetz has been writing small vignettes for VIM & VIGOR relating to the history of medicine, and he has supplied us with a number of tear sheets which are included in this Newsletter and make an interesting addition to the material which Mr. Helfand has been supplying to us.

I recently encountered a Dutch almanac that had a most interesting picture of a man being bled and a Uroscopist with a pharmaceutical factory in the background. Although the photocopy of this leaves something to be desired, I have included it out of the interest to the membership.

Finally, I am including two reprints with this letter. Dr. John Somberg was kind enough to send me a reprint of an editorial he wrote on digitalis for the AMERICAN HEART JOURNAL. Copies of that article are included with this Newsletter.

I am also including reprints of an article which I recently published on radium. The material in this article will be the subject of my presentation of my presentation at Chapel Hill, but I thought it would be of interest to have the article available to the readership, since the majority of you will not be attending the meeting at Chapel Hill.

Mr. Delehar's announcement of the Fourth Scientific Instrument Fair is included and, having attended the third show, I can recommend it heartily for those of you who are looking for fine quality acquisitions. Recently while I was in Toronto I attended the Museum of the History of Medicine and found it to be a very pleasant exhibition of medical artifacts. The museum's brochure is included.

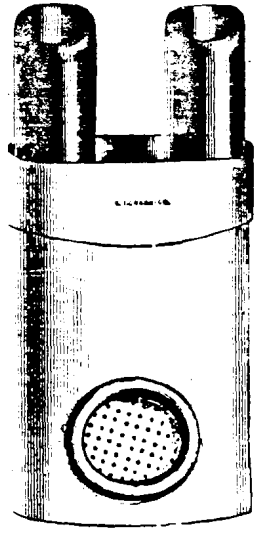
I also had the pleasure recently of attending the opening of the American Museum of Natural History exhibit "In Time Of Plague". Those of you who are in the New York area and can get to see this exhibit will find it most interesting and enjoyable. I certainly hope that the Newsletter gets to you in time for you to know about the exhibit before it closes.

Interest in the group continues to be great and I am delighted once again to take us into our fifth year. I welcome any suggestions, comments, additions or deletions that anybody may wish to make. I also welcome any contributions any of you may have that you think you would like to share with the rest of the membership.

The past two meetings have been very well attended and have been extremely enjoyable experiences. I urge any of you who can free-up the time to try to join us in Chapel Hill.

Sincerely,
M. Donald Blaufox, M.D.,PhD.

HELP WANTED



This inhaler was invented by Julian John Chisolm, M.D. while serving as a surgeon in the army of the Confederate States of America. After the Civil War it was manufactured by George Tiemann & Co and advertised in their catalogs at least as late as 1889. I am doing some research on Dr. Chisolm and would appreciate it if you would contact me if you have one of these or if you know a person or a museum that has one. (F.Terry Hambrecht, M.D., 14015 Manorvale Rd., Rockville, Md 20853)

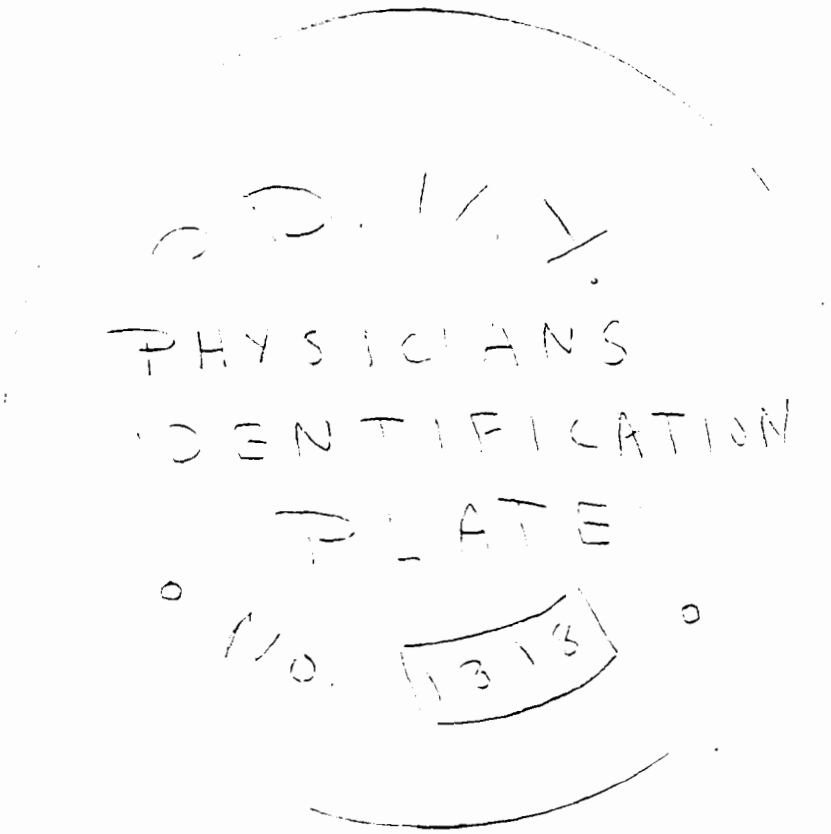
CAN YOU IDENTIFY THIS

Material: Brass Plate

Maker: Unknown

Presumed Use: Police Department of New York?
License Plate?

Date: Unknown



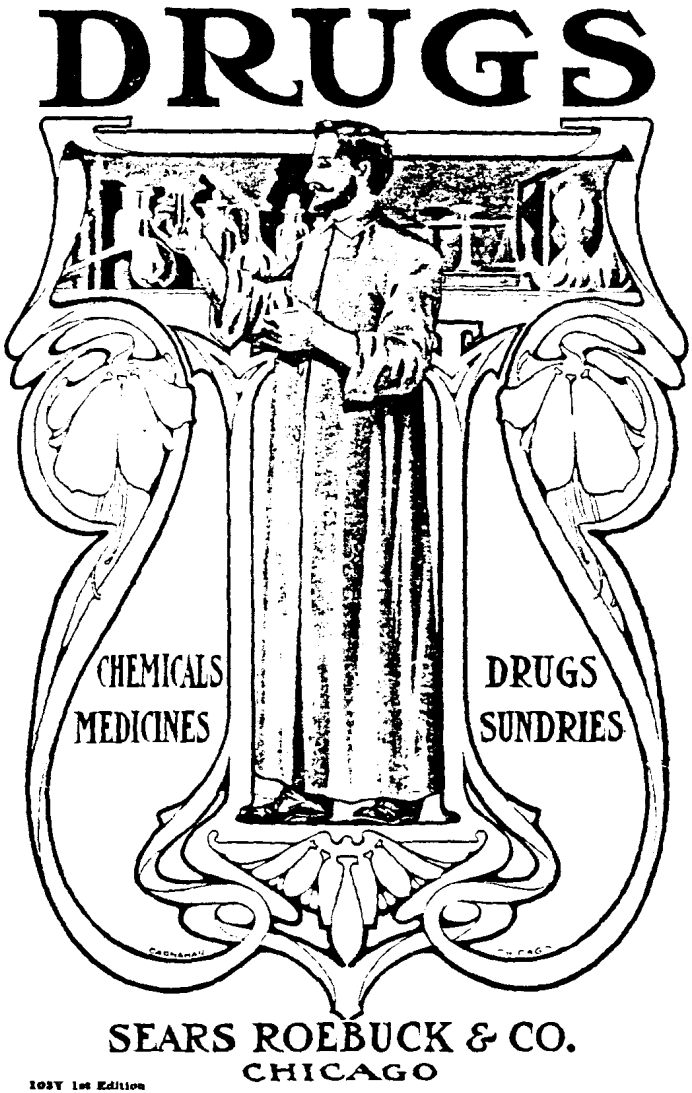
I think this is a:

From:

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

Historical Images of the Drug Market—X

by William H. Helfand



As if pharmacists 85 years ago did not have enough competitive problems from dispensing physicians, itinerant medicine show pitchmen, and other community pharmacists in their own vicinity; they also had to contend with mail order catalogs from huge national establishments including one of the largest of them all, Sears Roebuck and Co. In 1902, Sears issued the first edition of its Catalog of Drugs, a 242-page soft-bound pamphlet full of advertisements and claims for medicines and other specialties on which pharmacists normally made a substantial amount of their profits. Illustrated here is the attractive art nouveau titlepage of the catalog. Copy published by Sears was hard-hitting and verbose; the introduction promised that ". . . we offer you everything and more than you will find in the largest retail drug store in any city. You would find, almost without an exception, every article quoted in this catalog is offered at about one half the price charged by dealers generally, and in many instances, you will notice even a wider difference between our price and the price charged by others." The catalog appeared four years before the passage of the first Federal Food and Drug Act and contained numerous examples of the type of flamboyant statement expected from proprietary medicine promoters at the turn of the century. *(Size of titlepage, 10 x 6 7/8 inches. Original in W. H. Helfand collection.)*

Vol. 28 (1986) No. 2

From: PHARMACY IN HISTORY

't VIERDE DEEL DER

WYSE JAER-BESCHRYVER

Of Wonderlijcke

GENEES en HEEL-KONST,

BEHELSENDE

Een volmaeckte Beschrijvingh om alderley Siecktens/ Gebreken / Accidenten / Wonden / soo inwendigh als uytwendigh/ oude en nieuwe/ wel te kennen en te genesen; Handelende mede van Pestilentie en swangere Vrouwen.

Als oock 't rechte gebruyck van allerley *Kruyden*, *Wortelen*, *Zaden*, *Olien*, *Wateren tot Gesontheyt*: Mitsgaders een nieuw uytgevonden Disteleer-konst om deselve behoorlijck te prepareren.

Door d'Overleden Heer J. C.

t'AMSTERDAM,

By Cornelis Jansz. Boeckverkooper, aen de Nieuwe Kerck. 1662.

Johnson & Johnson

BACK PLASTER

FEELS GOOD ON THE BACK

Made with a heavy cotton backing to help provide warmth and support. Use for backaches, sore shoulders, sore arms, and other muscular aches and pains. The plaster may be cut to fit the affected area.

CONTAINS: Oleoresin of Capsicum in a suitable adhesive compound.

1 BACK PLASTER

SUPPORTS • HELPS WARM

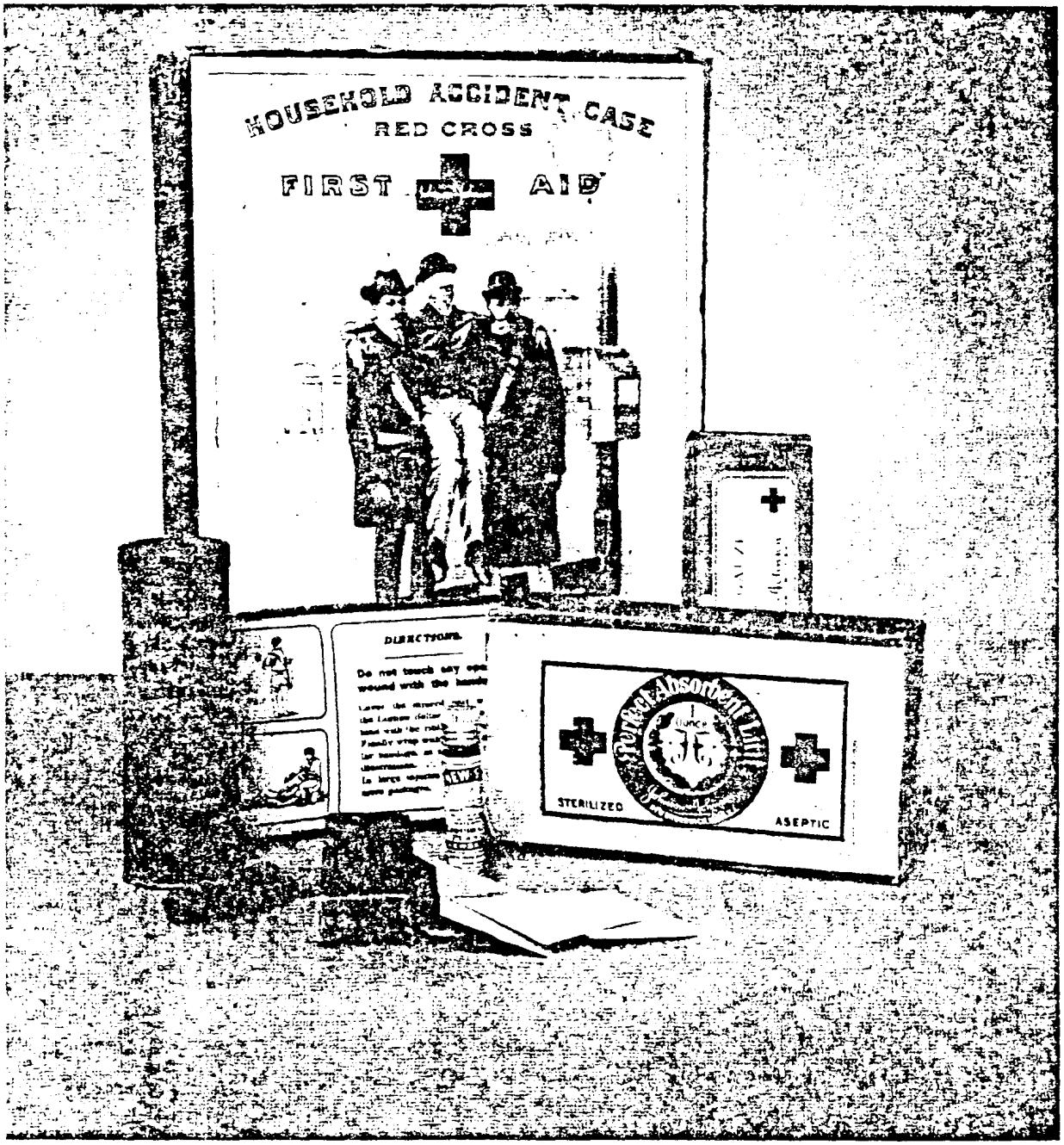
Johnson & Johnson
PRODUCTS INC.
New Brunswick, N.J. 08903 Made in USA ©J&J P.L 1986
CODE: HRI-8137-005801

5801BL

A LOOK BACK

By Robert E. Kravetz, M.D.

FASCINATING ARTIFACTS FROM THE HISTORY OF MEDICINE



COURTESY OF ROBERT E. KRAVETZ, M.D., CURATOR, MEDICAL MUSEUM, PHOENIX BAPTIST HOSPITAL. PHOTOGRAPHED SPECIFICALLY FOR VIM & VIGOR

In the past, just as today, it made good sense to own a first aid kit for use at home or while travelling. This "household accident case" dates from the early 1900s. Note the dress of the men pictured on the cover.

In 1886 the three Johnson brothers formed a partnership to manufacture plasters. The next year the firm incorporated under the name Johnson & Johnson and began making surgical dressings and antiseptic sutures. Today, Johnson & Johnson is the nation's largest manufacturer of first aid kits.

Interestingly, the contents of first aid kits has not changed much in the past 100 years. Bandages, dressings, gauze, plasters and antiseptics similar to those pictured are still used today.

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UNITED STATES PATENT OFFICE.

JAMES W. W. GORDON, OF CATONSVILLE, MARYLAND.

SPRING-LANCET.

Specification of Letters Patent No. 16,479, dated January 27, 1857.

To all whom it may concern:

Be it known that I, JAS. W. W. GORDON, of Catonsville, in the county of Baltimore and State of Maryland, have invented certain new and useful Improvements in Spring-Lancets; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification.

The nature of my improvement of the ordinary spring lancet consists in so providing it with a shield, that a certainty of depth in the incision shall be secured and thus all danger of transfixing the vein is obviated, the movable shield serving also as a means of giving the same depth to the cut of the fleam when new, as after repeated sharpenings, its simplicity preventing any liability of accident, and the expense of construction is very slightly increased over those now in use. The lancet being constructed independent of the shield, in which it slides and being confined therein by a set screw, It will be noticed that the blade will enter the vein at the same angle irrespective of the depth to which the instrument is regulated, and should the set screw accidentally become loose, the only effect would be, that of the lancet retreating from the vein by the sliding thereof in the shields or graduator. The trigger differs from those of the ordinary spring lancet by being formed with greater breadth and in the number of notches: the object thereof being that of overcoming a difficulty which would otherwise result of obtaining sufficient force of the main spring in bleeding shallow. In that case the handle of the spring is drawn back to the farthest notch, and to the shoulder of the lancet frame; then the mainspring will have its tension.

In the accompanying drawings Figure 1. shows the side of the shield with its set screw retaining the lancet frame (see in red dotted line) as drawn toward the back edge of the shield, the fleam in this case will cut shallow. In Fig. 2. the frame is slid across the shield (within which it lies) to the front edge, and in that case the fleam will cut deeply. Fig. 3 is a top view with the slide removed. Fig. 4 is a top and edge view of the shield: Fig. 5. a top and side view of the slide exhibiting the trigger.

The shield (*a a*) is formed of metal and of a sufficient width to allow the lancet frame *b b* to be moved from side to side thereof. A slot or opening (*c c*) is made in it, for the purpose of allowing the neck of the set screw (*d*) to pass through it: a nut or female screw is formed in the thickness of the lancet frame to fit the screw of (*d*). The fleam and springs are of the character usually employed in spring lancets, and the lancet is closed within the shield by the slide (*e*) in the usual manner of such lancets.

(*f*) is the trigger made broad at its catch end, so as to receive 3 or 4 nicks instead of one to accommodate the change of the spring as the lancet frame is moved from side to side of the shield.

The mode of employing the shield in regulating the depth will readily be understood and its use as a gage for the cut of the lancet is important. The lancet and shield after the set screw is tightened is held to the vein in the same manner as the ordinary spring lancet, and the trigger liberated by pressing thereon.

Having described my improvement what I desire to secure by Letters Patent is—

The providing the ordinary spring lancet with a sliding shield *a a* having a movement from side to side in the manner and for the purposes set forth.

In testimony whereof I have signed my name before two witnesses.

J. W. W. GORDON.

Witnesses:

JOHN F. CLARK,

JOHN S. HOLLINGSHEAD.

J. W. W. Gordon.

Landet,

No. 16,479, Patented Jan. 27, 1857.

Fig: 1.

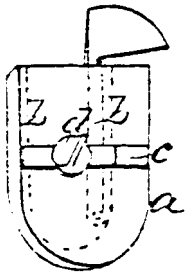


Fig: 2.

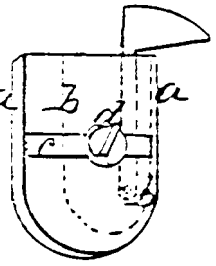


Fig: 3.

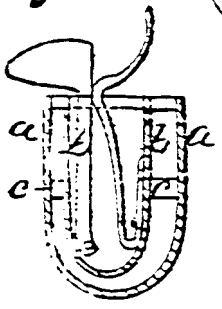


Fig: 4.

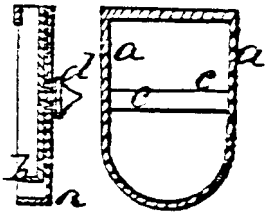
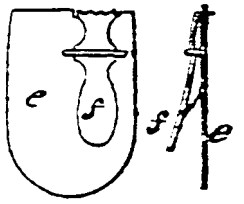


Fig: 5.



Digitalis: 200 years in perspective

J. Somberg, M.D., D. Greenfield, B.A., and D. Tepper, M.D. *Bronx, N. Y.*

It is now 200 years since Withering[1] first reported on his careful clinical pharmacologic observations on the use of digitalis. *An account of the foxglove and some of its medicinal uses—practical remarks on dropsy and other diseases* remains one of the most comprehensive presentations on the introduction of a drug based on a case studies approach. This text carefully details Withering's clinical experience with digitalis in 163 patients over a 9-year period. The identification of the active digitalis ingredient from an herbal preparation was one of Withering's accomplishments, but of equal significance were his establishing a standardized preparation for clinical testing, developing a dose-response relationship, and carefully chronicling the drug's clinical toxicity. Withering had the intuitive judgement of a great clinical pharmacologist and his treatise was a model of clinical pharmacologic investigation. Indeed, this had to be the case in order to overcome the vagaries of human nature which, both before and after his time, resulted in misuse of the cardiac glycosides to such an extent as to make them useless in clinical medicine as well as dangerous to those being treated. Excessive and indiscriminant dosing is not unique to digitalis, but its history is a testimonial to the need for clinical pharmacology, if therapeutics is to succeed in benefiting patients.

Early history. Many centuries before Withering studied the properties of the purple foxglove, the Chinese were reported to be familiar with the medicinal powers of the dried powdered skin of their indigenous toad, *Bufo gargarizans*. One of the compounds contained in the skin is the cardioactive steroid bufalin which, aside from having five instead of four carbons in its lactone ring, is chemically similar to digitoxigenin, the simplest genin in the digitalis series.[2] The Latin scientific name was coined by the sixteenth century Bavarian physician Leonard Fuchs as a translation of the German word for the plant, fingerhut, that is, thimble, which actually describes the shape of the flower. In his *De Historia Stirpium Commentarii* (1542), one of the first scientific herbals, Fuchs described the plant as a purgative and emetic. He proposed that the plant was useful in the treatment of dropsy.[3]

The use of digitalis as a medicinal plant can be traced both among the Irish monks and in Germany where it appears to have been cultivated as early as the time of Charles the Great. After Fuchs no mention of the foxglove appeared in German-speaking countries until Withering's day. In England, digitalis was mentioned in herbals by Gerarde in 1597 and by Parkinson in 1640. Digitalis entered the London pharmacopeia in 1661. Yet, digitalis failed to maintain its foothold in therapeutics because of its prohibitive toxicity. Digitalis was used as a remedy for illnesses of the most varied kinds, such as epilepsy, sores, swellings, vertigo, and skin diseases. Like so many other medications, it was purged from the London pharmacopeia in the 1740s as a medical reform movement gained momentum.

The early therapeutic uses and scientific codification by Fuchs, in 1542, for the use of digitalis in dropsy ended not because of the drug's inefficacy but because of the lack of a rational therapeutic approach to its use. While the scientific world condemned digitalis (especially since reports of experiments in turkeys showed that it caused the viscera to dry up), herbalists ignorant of these learned opinions proceeded to utilize cardioactive glycosides.

Withering and digitalis. One bastion of the herbalists and foxglove remedies was the midlands of England where the foxglove *(Digitalis pupurea)* grows abundantly. It was here, outside Birmingham, that Withering was inspired to reintroduce this medication. Besides the plant being indigenous and abundant it was a part of the folklore of this region. The midlands were undergoing an industrial revolution and a concentration of wealth combined with a free-thinking period of scientific and political explo-

From the Cardiology Division, Departments of Pharmacology and Medicine, Albert Einstein College of Medicine.

Supported by an Established Investigatorship from the American Heart Association (Dr. Somberg).

Received for publication Aug. 27, 1985; accepted Sept. 4, 1985.

Reprint requests: John C. Somberg, M.D., Albert Einstein College of Medicine, 1300 Morris Park Ave., F-208, Bronx, NY 10461.

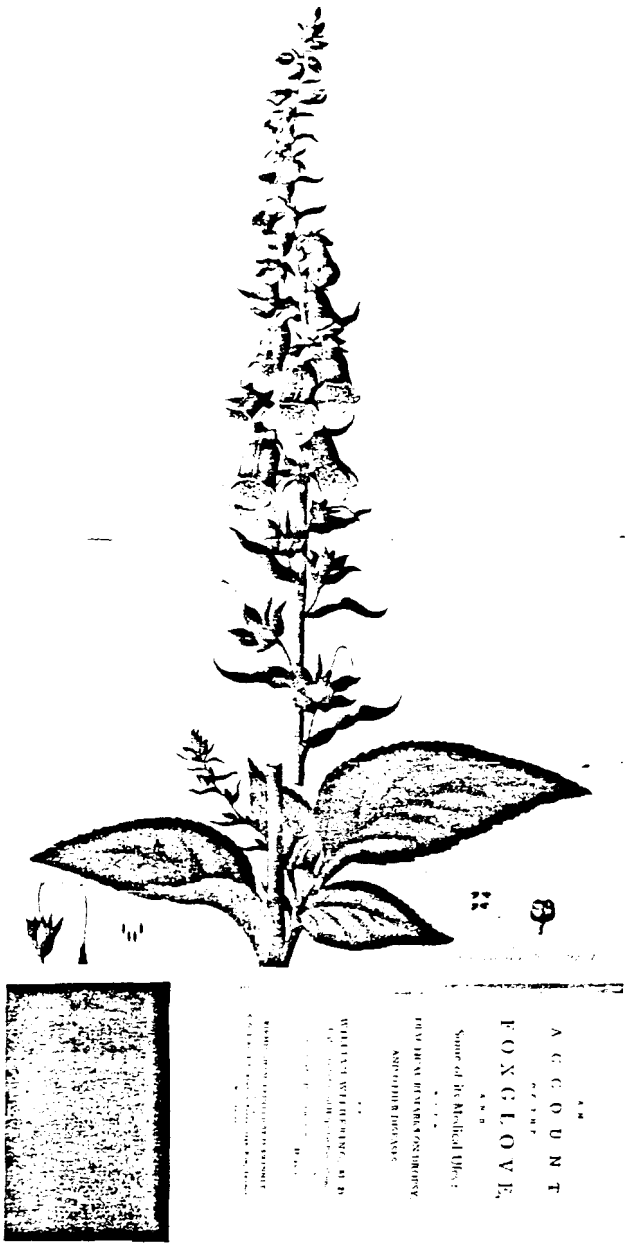


Fig. 1. Frontispiece of Withering's treatise on digitalis: *An account of the foxglove, and some of its medical uses.* Birmingham, 1785. M. Swinney, with foldout botanic print of the foxglove plant.

ration. This was the age of political change, concepts of representation, and individual freedom and law became the cornerstone of the emerging American and French democracies. Birmingham was also the seat of the industrial revolution transforming England into the world's leading power. Withering was part of this world and was uniquely prepared for his discovery.

Fig. 2. Portrait of William Withering, physician and botanist, who was responsible for the introduction of digitalis into clinical medicine.

Born in 1741, son of a Shropshire apothecary, nephew of two physicians, Withering trained as an apothecary familiar with obtaining medicine from plants. He attended medical school in Edinburgh and obtained his medical degree in 1766. Edinburgh was a leading medical school steeped in the scientific method and experimental fervor and provided considerable training in botany, an area which young Withering complained about in a letter home.[4,5] Withering started medical practice in Staffordshire. He fell in love with a young lady who was a painter of botanic arrangements and this may have had some influence on his increased liking of botanical subjects. In 1776, he published *"A botanical arrangement of all the vegetables naturally growing in Great Britain."*[6] This was the first flora of Great Britain to use the Linnaean binomial nomenclature. In 1775, at the suggestion of Erasmus Darwin, Withering moved to Birmingham, purchased the practice of Dr. Small, and became a very successful medical practitioner and chief of the medical infirmary. Also in that year, he was inducted into the Linnaean Society whose members included Priestley

and Watts. This society consisted of a small group of innovative individuals and scholars.

This was a busy and exciting time in Withering's life. However, he did make time to see indigent patients. During one of these visits he encountered a patient who was helped by an herbal cure. Given his knowledge of botany, Withering tells us that it was rather simple to discern that the foxglove plant, then thought to be poisonous, was the active ingredient.[1]

> "In the year 1775 my opinion was asked concerning a family recipe for the cure of the dropsy. I was told that it had long been kept a secret by an old woman in Shropshire who had sometimes made cures after the more regular practitioners had failed. I was informed that the effects produced were violent vomiting and purging, for the diuretic effects seemed to have been overlooked. This medicine was comprised of twenty or more different herbs, but it was not very difficult for one conversant in these subjects to perceive that the active herb could be no other than the foxglove."

Withering was already aware of the potential use of the foxglove and he refers to it in his book *Botanical arrangement:* "a dram of it taken inwardly excites violent vomiting. It is certainly a very active medicine and merits more attention than modern practice bestows upon it." Over the next 9 years Withering proceeded to systematically study clinical effects of a powdered extract of the foxglove plant in patients with edema and dropsy (congestive heart failure). His results culminated in publication, a decade later, of his treatise, *An account of the foxglove* . . . a report of the successes and failures in over 163 patients with most of the results being positive. By using doses of only one grain (twice daily), coupled with opium to control nausea and vomiting, Withering was able to moderate most of the toxicity associated with digitalis therapy.

Rietbroeck and Woodcock[1] evaluated Withering's results and reported, "the therapeutic success rate achieved by Withering using an infusion in the form of foxglove tea and later dried leaf was remarkably high (72%). The recorded incidence of side effects was 18%."[7] In 1810 Mclean, with the use of Withering's methods, reported a success rate of 83% in 94 patients with dropsy and an incidence of side effects of 16%. The incidences of side effects reported by Withering and Maclean are not significantly different from recently published results from patients given pure glycosides.[7] The remarkable success rate and rather low toxicity observed by Withering and those who followed his method attest to his skills in therapeutics. However, the use of opium may also provide an explanation for these outstanding results. Digitalis has deleterious actions on systemic resistance which increases through alpha-adrenergic stimulation[3] as does sympathetic activity, thus predisposing the heart to arrhythmias.[9] Opium, like morphine, causes vasodilation, counteracting the rise in resistance as well as unloading the failing ventricle. Additionally, opiates increase parasympathetic neural activity and thus decrease sympathetic activity, decreasing the likelihood of cardiac arrhythmias caused by digitalis. Perhaps the combination of opium and digitalis as Withering used the drugs was uniquely synergistic, rivaled today only by the use of vasodilators and careful monitoring of drug levels.

Withering believed that the benefits of digitalis derived from its diuretic action, although he mentioned in the conclusion of his *Account of the foxglove* . . . that the drug "has a power over the motion of the heart to a degree yet unobserved in any other medicine and this power may be converted to salutory ends." In February, 1779, Dr. Jonathan Stokes, a friend and physician at Stourbridge, wrote to the medical society of Edinburgh about Withering's discovery, and by late 1779 the drug was in general use in the Edinburgh infirmary. Erasmus Darwin saw a patient in consultation with Withering and later inserted the successful use of digitalis into a book he published, authored by his deceased son, Charles Darwin, who died of a dissection wound in Edinburgh. Although a controversy developed as to priority in publication, clearly Withering deserves credit for the insightful observation as well as the 163 case studies showing us the benefits and dangers of the digitalis glycoside.

The clinical use of digitalis caught on rapidly throughout England. Great debates raged regarding its safety, and Withering's warnings concerning specific disease states for which its use was intended were soon disregarded. Many a leading London physician caused digitalis toxicity by improper administration of the new drug.

In correspondence the year before his death from pulmonary tuberculosis in 1798, Withering asked his publisher about the state of his accounts since he paid to publish his books and was hoping for additional funds. Withering was about to start building a new home which he hoped would be warmer and better for his lung condition. Just 8 days after moving into his new estate, Withering died in 1799.

The declining period. Withering's scientific legacy

was established but the utility of digitalis was severely limited by the lack of therapeutic skills of physicians following him. The dosages prescribed were excessive, toxicity was rampant, and the drug was used for disease states in which it could have no benefit. All forms of edema were treated; pulmonary tuberculosis was a favorite, as was just about any condition. Nervous afflictions were also thought to respond to digitalis therapy. These misconceptions continued late into the nineteeth century. Interestingly, it has been suggested that digitalis played a role in the illness of Vincent Van Gogh. His use of yellow, green, and purple as well as color swirls may have been generated by his memory of toxic visual symptoms of digitalis overdose. Two paintings of Van Gogh's doctor, Dr. Gachet, show him holding the foxglove. Dr. Gachet was known to follow the common clinical use of digitalis for the treatment of neuroses.[10]

The use of digitalis became known in France and Germany, but the toxicity problem limited its acceptance. One of the first American clinicians to use digitalis was Hale Jackson (1739 to 1797) from Portsmouth, New Hampshire. After reading Withering's book, he wrote Dr. Withering and requested seeds to grow digitalis in America. Withering responded with seeds and recommended dosages which proved successful for Jackson in his clinical practice.[11]

The gradual introduction of digitalis did have periods of notable accomplishment. John Ferriar (1761 to 1815) of Manchester recognized the great utility of the drug on cardiac function. In his essay on the medical properties of digitalis he states that "extractions from the leaf furnish us a means of regulating the pulse to our wish and supporting it in a given state of velocity as long as we may judge it proper."[12] Ferriar has been credited with being the first to realize that the primary site of action for digitalis is the heart. In the same year, 1799, Thomas Beddos wrote that digitalis "increases the organic action of the contractile fibers," an observation coming close to our modern understanding of the drug's mode of action. Beddoes also found that digitalis gave relief to patients with lung diseases only when the disease was not limited to the lung, specifically, when the disease was secondary to heart failure.

To stimulate research, in 1835, La Societe de Pharmacie de Paris offered a prize of 500 francs for the best answer to the question, "Does there exist in *Digitalis purpurea*, one or more proximate principles, to which the medical properties of this plant may be attributed."[13] Five years later, in 1840, when no pure principle had yet been brought forward, the Society doubled the prize. In 1841, Homolle[13] won the prize when he prepared a partly crystalline material, which was quite active biologically, from the leaves of digitalis purpurea. In 1836, Claude Adophe Nativelle, a chemist in Paris, tried for the first time to isolate the active principle of digitalis. A prize offered by the Chemical Society was also given to Nativelle in 1872 for his work on isolation of active digitalis compounds. He announced a chloroform extract of constant strength, namely, crystalline digitalin.

Digitalis and the irregular pulse. In 1879, James Mackenzie went into general practice in Barnley. He recorded simultaneously arterial and venous pulses, making remarkable progress in the analysis and understanding of cardiac arrhythmias. He was the first to show the effects of digitalis on increasing the heart block in atrial fibrillation and its effect on slowing the rate of atrial fibrillation and thus increasing cardiac performance.[14] Mackenzie believed digitalis was of value primarily in patients with atrial fibrillation and did not advocate its use in patients with heart failure without atrial fibrillation.

In *Oxford Medicine*[15] he wrote:

> "The best effect of digitalis is seen in cases of heart failure with dilatation of the heart and dropsy. Eighty or ninety percent of such cases suffer from auricular fibrillation. If we scrutinize the published records of cases that have benefited by the drug we find that the great majority of these results occur in one condition, auricular fibrillation or its allied condition auricular flutter."

From the days of Mackenzie and Cushney's collaboration, the effects of digitalis on atrioventricular node conduction became evident.

"They attached electrodes to the beating atria of the dog heart. By means of a mild tetanizing current they disturbed atrial rhythm and produced a condition comparable to the clinical picture of atrial fibrillation. This disordered atrial rhythm affected the beat of the ventricles, the beat became rapid and less effective. Digitalis was given, the tetanizing current was continued. The atria continued in their state of fibrillation. But, the ventricles no longer were affected by the arrhythmia of the atria. The ventricular beat was slowed and soon become more effective. Digitalis blocked the conduction of the impulse at the AV node."

The work of Mackenzie, Cushney, and Lewis led to the belief that digitalis was only effective when atrial flutter or fibrillation was present. This belief has continued in some circles to the present, although studies have clearly demonstrated the inotropic action of digitalis.

Digitalis and cardiac contractility. Henry Christian, Physician-in-Chief at the Peter Bent Brigham Hospital, took exception to the view that digitalis was of value only in patients with supraventricular tachyarrhythmias.

> "My views evidently differ from those of my fellow editor of the Oxford Medicine. The views of Sir James Mackenzie . . . have been concurred in by the numerous observers with the result that there is a growing feeling that unless the pulse is absolutely irregular and rapid, little is to be gained from digitalis therapy. My own experience is so directly contrary to this that it seems worth while to restate the views already expressed by me . . . my own view with regard to digitalis is that digitalis, as a rule, has a striking effect on those changes in the patient, which are brought about by cardiac insufficiency and this effect appears irrespective of whether or not the pulse is irregular."[16]

James Pratt and Henry Jackson, both from the Harvard Medical School, introduced the practice of continued digitalis administration. They observed that stopping the administration of digitalis soon led to the reappearance of symptoms of cardiac insufficiency.

Still the effects of digitalis in heart failure were questioned, with considerable research demonstrating many cardiac and extracardiac effects. The study of Gold and Cattell,[17] in 1938, clearly demonstrated the inotropic effects of digitalis in the feline right ventricular papillary muscle. Since then, digitalis has remained a major part of the therapeutic approach to patients in congestive heart failure. It remains the only inotropic agent that slows the ventricular response in atrial flutter and fibrillation. The digitalis glycosides have increased our understanding of cellular mechanisms involving contractility[8] and the use of antibodies to measure drug levels[19] and to treat toxicity,[20] and have provided a useful therapy for chronic atrial fibrillation and heart failure. In the last 50 years many seminal studies involving drug interactions,[21,22] bioavailability,[23] drug disposition,[24] elimination,[25] and clearance[26] have had their origins in clinical problems relating to digitalis administration. In a sense we have been redefining, in terms of the twentieth century, the admonitions and experience of William Withering, obtained by his most careful observations on the use of the foxglove. As Withering once wrote:

> "The foxglove's leaves with caution given,
> another proof of favoring heav'n
> will happily display
> The rapid pulse it can abate,
> The hectic flush can moderate
> and, blest by him whose will is fate,
> May give a lengthen'd day."

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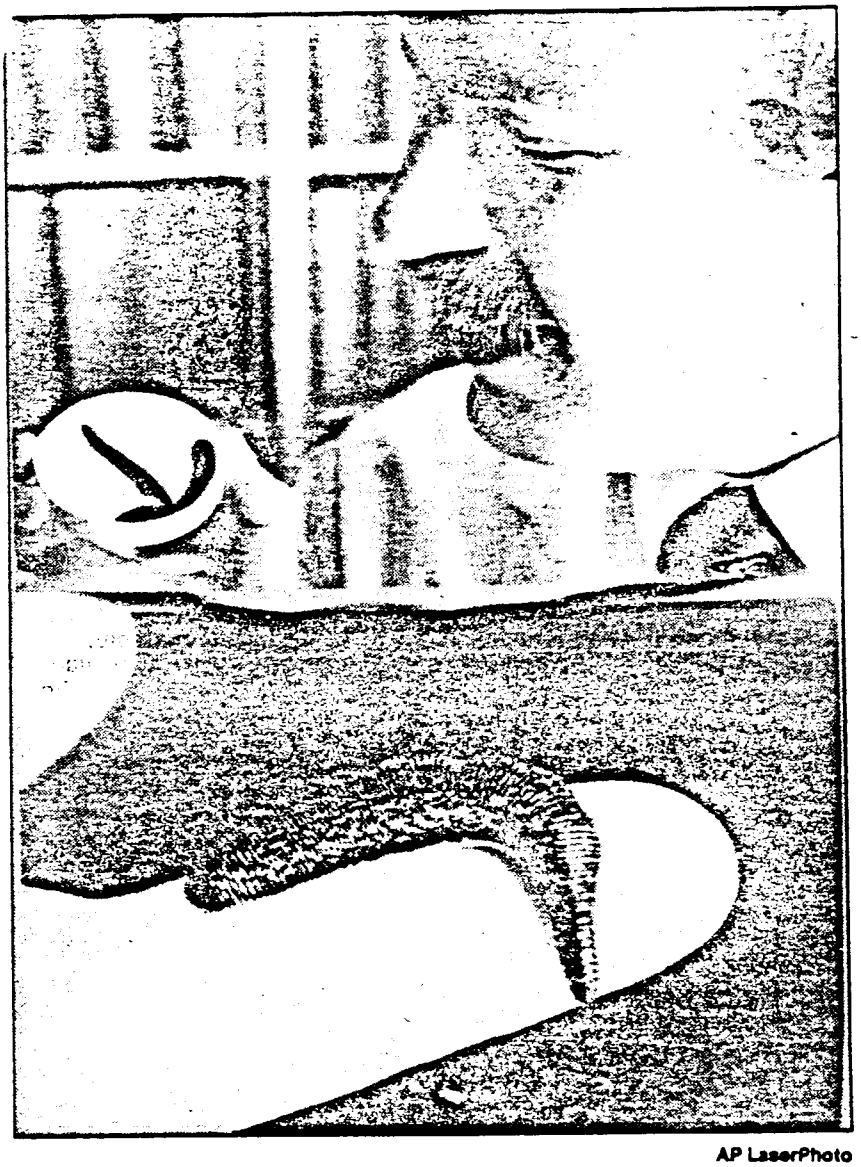

AP LaserPhoto

Leeches in use again

Dr. Bruce Kramer, top, a plastic surgeon at Children's Hospital in St. Louis, holds a few of the leeches that were used to save the finger of a 23-month-old Belleville boy. A $6 leech was used to suck the blood out of the boy's finger after a table fell on him while he was playing.

CHARLESTON TIMES-COURIER 12/9/87

MEDICAL MUSEUMS OF THE WORLD

PART XI

THE UNITED STATES

BY

PROFESSOR E. T. PENGELLEY

THE UNITED STATES

The biological and medical history of the United States must be viewed in the overall context of its general history. This, as compared to the countries I have already considered, is relatively short, and in addition much of this has been primarily concerned with frontier and quick developmental problems, rather than with science. Indeed I think it reasonably accurate to say that science in the United States did not come into its own until World War II, but with this it quickly became one of the leading scientific countries of the world. There is another pertinent factor however, which is that as a nation it is not very good at preserving its cultural heritage, the regrettable tendency being to bulldoze everything under and start again. In addition it is a large country, expensive to get around in, and thus I have not yet been able to visit and describe some of the places I would have liked to. All this having been said, there are some things of historical interest and importance in biology and medicine with which to tempt the reader. Since almost everything I will refer to is in a large city, I do not think it necessary to indicate its location or how to get there.

BOSTON

Boston, Massachusetts, is one of the oldest cities in the U.S.A., and has played a major role in the cultural development of the country, not the least aspect of which has been its role in scientific development. This has largely been based in and around Harvard University, which is the oldest institution of learning in the United States. It was founded in 1636, and at first conferred only arts degrees, but as early as 1782 it had a medical school. This, together with the accompanying biological and physical sciences has generally prospered, and today Harvard is one of the great Universities of the world. Also it was in close association with the Harvard Medical Faculty, that the first introduction of surgical anesthesia in medicine took place in 1846. A major milestone in the history of medicine.

Massachusetts General Hospital
Cambridge and North Grove Streets
Boston

Opening Hours: Normal business hours. It is a working hospital.

The Massachusetts General Hospital is the oldest in Boston, with origins going back to the early 19th century, and is today a vast complex of buildings. Its world-wide fame is due to many discoveries and events which have taken place there, but none compares in importance with the first effective use of surgical anesthesia which was administered there on October 16, 1846.

There is considerable doubt as to who was actually the first person to use anesthesia effectively, in the sense of suppressing pain, particularly during surgery. Thus a short account here of this history is pertinent, and will give the reader more perspective.

It has been pointed out elsewhere (see under London and Edinburgh, Britain) that operations prior to anesthesia can only be described as "nightmares," and were usually confined to amputations or some form of superficial surgery.

Nevertheless pain suppressing drugs have been used throughout recorded history, heroin and alcohol are two common examples, and the art of hypnotism has also been used for centuries. However, towards the end of the 18th century chemistry was far enough advanced that new gases were becoming available which had extraordinary properties. One of these was nitrous oxide (commonly called laughing gas) and the famous English chemist, Sir Humphry Davy (1778-1829) experimented with this as early as 1799. He tried it out on himself, realized it produced insensibility to pain, and suggested that it should be used during operations. Nothing seems to have come of this, probably because the social and medical "climate" was still not ripe for such a novel idea.

During the early part of the 19th century other gases were produced, and one of these was sulphuric ether. This also produced insensibility to pain, and it became popular amongst the socially elite, particularly in the United States, in the form of "ether frolics." These were essentially "avant-garde" parties during which the participants sniffed varying amounts of ether. At one of these, the imagination of a young surgeon from Georgia was aroused by the fact that when a person under the influence of ether was injured he did not seem to feel any pain. The surgeon's name was Crawford Williamson Long (1815-1878), and he immediately realized the potential of ether. On March 30, 1841, he tried it out successfully on one of his patients during the removal of a tumor from the neck. We know very little about Long, he was born in Danielsville, Georgia in 1815, received his early education in Athens, Georgia, studied medicine and received his degree from the University of Pennsylvania in 1839. After graduation he worked for a while in various New York hospitals, but soon went back to Georgia where he became a successful physician. He died in Athens in 1878.

Shortly after Crawford Long first used ether as an anesthetic, a young dentist named Horace Wells (1815-1848) from Hartford, Vermont, used nitrous oxide on himself while an assistant painlessly extracted one of his teeth. This was in 1844, and Wells subsequently used nitrous oxide on many of his patients. Wells was thoroughly convinced of the effectiveness of nitrous oxide, and in 1844 he persuaded a Dr. Warren of the Harvard Medical School to let him demonstrate his discovery during the extraction of a tooth at the Massachusetts General Hospital. Unfortunately, the demonstration failed, as the patient experienced severe pain, and Wells was laughed out of the hospital. Thereafter Wells was a tragic figure. He became addicted to chloroform, with which he also experimented, his mind failed, and in 1848 at the early age of 33 he committed suicide, while in a New York jail.

Wells at one time had a dental partner by the name of William Thomas Morton (1819-1868). He was born in Charlton, Massachusetts, and studied dentistry in Baltimore. He was also a medical student at Harvard, but left before receiving his degree. While practicing dentistry in Boston he got to know a chemist by the name of Charles T. Jackson, who gave him some ether and suggested its use as an anesthetic. Morton successfully used ether on a patient in September 1846, and a few weeks later persuaded Dr. Warren, the Harvard surgeon, to let him give, like Wells before him, a public demonstration of this at the Massachusetts General Hospital. This was done on October 16, 1846. There are several fragmentary and differing accounts of this great event. The name of the patient was Gilbert Abbott, and he was to have a tumor removed from his neck. Morton was late for the operation -- not a good beginning!-- but in due course he arrived and administered the ether by mouth from his primitive inhalator.

Dr. Warren then proceeded with the operation, which lasted about three minutes, during which the patient did not move nor indicate any signs of pain. When it was over and the patient aroused, Dr. Warren asked him if he had felt anything, to which he replied "I thought I felt someone scratching at my neck" upon which Warren turned to his audience and said, "Gentlemen, this is no humbug. We have seen something today that will go round the whole world!" Warren's words proved to be correct, even though it took a considerable time to improve the techniques of administration of the drug, but effective anesthesia was henceforth on its way as a medical aid, and one of the greatest blessings to humans. The introduction of anesthesia ranks with antiseptic as a major medical advance, and both of them were prerequisite to the development of modern surgery.

Unfortunately the story of the discovery of anesthesia does not have a happy ending. After Morton's demonstration in the Massachusetts General Hospital the news spread rapidly, but there ensued a bitter controversy between Morton, Jackson, Wells and Long as to priority. Jackson, Wells and Long wanted nothing from their discovery except to benefit mankind. The same cannot be said of Morton, who generally does not seem to have been a likeable character. He tried for the rest of his life to patent anesthesia and extract a royalty for every anesthetic given. However he was unsuccessful in this, neglected his practice, and died in poverty in New York in 1868.

The Ether Dome, Bullfinch Building

Returning to the scene where this famous operation using anesthesia took place. This was in the Ether Dome of the Bullfinch Building. This Ether Dome can actually be seen on top of the building from the outside, but is best seen from the inside. Permission for this must be obtained from the hospital administration, but is normally granted if the room is not in use. The Ether Dome was originally the operating amphitheatre of the hospital and was used as such from 1821-1867. It has undergone several alterations since then, and is now used as a demonstration and lecture room. Nevertheless, it was here that anesthesia became a meaningful reality, a fact commemorated by a large plaque on the main wall of the amphitheatre. It reads as follows:

ON OCTOBER 16, 1846 IN THIS ROOM THEN THE OPERATING THEATRE OF THE HOSPITAL

WAS GIVEN THE FIRST PUBLIC DEMONSTRATION OF ANESTHESIA

TO THE EXTENT OF

PRODUCING INSENSIBILITY TO PAIN DURING A SERIOUS SURGICAL OPERATION

SULPHURIC ETHER WAS ADMINISTERED BY WILLIAM THOMAS GREEN MORTON A BOSTON DENTIST

THE PATIENT WAS GILBERT ABBOTT

THE OPERATION WAS THE REMOVAL OF A TUMOR UNDER THE JAW

THE SURGEON WAS JOHN COLLINS WARREN

THE PATIENT DECLARED THAT HE HAD FELT NO PAIN DURING THE OPERATION

AND WAS DISCHARGED WELL DECEMBER 7

KNOWLEDGE OF THIS DISCOVERY SPREAD FROM THIS ROOM THROUGHOUT THE CIVILIZED WORLD

AND A NEW ERA FOR SURGERY BEGAN

It is a truly emotionally rewarding experience to stand in this room and realize the great event which took place here. In the room there are also displays of various early types of apparatus for the administration of anesthetics.

As pointed out previously, Morton administered his anesthetic by mouth from a glove-like glass inhalator. The original of this survives, but is so valuable that it is kept in the hospital vault and is not available for viewing. However, an exact replica of it has been made, and this is displayed in the main corridor of the ground floor of the Bullfinch Building. There are other fascinating display cases here as well. The visitor cannot help but be impressed with the long way we have come since the introduction of anesthesia in 1846. There are many other interesting places in Boston, which are of interest in the history of biology and medicine, but none approaches in importance the one we have described.

CLEVELAND

The Howard Dittrick Museum of Historical Medicine
11000 Euclid Avenue
Cleveland, Ohio 44106

Opening Hours: Monday - Friday, 10.00 - 17.00
Sundays, 13.00 - 17.00

My knowledge of this museum, founded in 1926, is secondhand for I have not been able to visit it. However, it is said to have some fine collections and displays in the history of medicine.

MACKINAC ISLAND, MICHIGAN

This is an island in Lake Huron at its northwestern tip, just where it joins Lake Michigan. It was here on June 6, 1822 that an accident occurred which gave an opportunity to an American army doctor to make some very important discoveries in the field of gastric physiology. The doctor's name was William Beaumont (1785-1853) and he made full use of the opportunity. This event is commemorated here. The island can only be reached by ferry (no cars) from either Mackinaw City or St. Ignace.

William Beaumont was born in Lebanon, Connecticut, the son of a farmer. He did not wish to become a farmer himself, left home as a young man, and for about

three years he taught in primary schools, but soon became a doctor's apprentice and received a license in 1812 to practice in Vermont. This was the year war broke out between Britain and the United States, and Beaumont quickly joined the army as a surgeon. He served in a variety of places, but in 1822 he was ordered to Fort Mackinac, and on June 6th the now famous accident occurred. -- A French Canadian trapper by the name of Alexis St. Martin, received a massive wound in his left side from a musket. Both the stomach and one lung were severely damaged. He was quickly put under the care of Beaumont, who did what he could for him, but he did not expect the trapper to live. However, in one of those rare instances where "nature simply takes a hand," Alexis St. Martin did live, and as the wound healed a gastric fistula developed between the abdominal surface and the interior of the stomach. The word fistula is derived from the Latin meaning "pipe," and this accurately describes the situation, for through the abdominal opening the surgeon had direct access to a living functional stomach. Beaumont quickly realized that here was a golden opportunity to carry out investigations into digestion in a living person, and from 1825-1833 he used Alexis St. Martin as the subject of a variety of experiments. Beaumont's knowledge of chemistry was very limited, but he sought good advice, and quickly established the presence of free hydrochloric acid in the stomach and also the contractions of the stomach muscles. These were merely preliminary observations. He went on to show that gastric juice secretion, and thus digestion, were greatly influenced by psychic factors, that the juice was not found in the stomach in the absence of food, and that water passed rapidly out of the stomach into the duodenum. He also studied the effects on gastric secretion of various foods, including coffee, tea and alcohol.

Beaumont's experiments ended in 1833 with the publication of his great work "Experiments and Observations on the Gastric Juice and the Physiology of Digestion." It is one of the great works of experimental medicine and laid the foundations of the science of digestive physiology.

Beaumont left the army in 1839 and went into private practice. All accounts indicate he was good at this, and was a popular physician. He died in 1853 as a result of an accidental fall.

The William Beaumont Memorial Building
Mackinac Island
Mackinac Island State Park Commission
Lansing, Michigan 48909

Opening Hours: It is only open during the summer months:
May 15th - October 20th
Daily: 9.00 - 17.00

These times may change so be sure to check with the park headquarters (above). Regrettably, I have not been to this memorial, but what follows comes directly from the superintendent of the State Park.

The Beaumont Memorial on Mackinac Island was a gift to the Park by the Michigan State Medical Society. It consists of the building, formerly the American Fur Company's retail store, where Alexis St. Martin was accidentally shot. It has been completely restored. On the ground floor there are two

rooms, the first furnished with French-Canadian furniture of the period, and the second with Beaumont's furniture. There is also the Dean Cornwell painting of William Beaumont and Alexis St. Martin. On the second floor there is a medical history museum, which includes some of Beaumont's instruments. Also four scale dioramas depicting phases of the physician's life and experiments. Finally at Fort Mackinac itself, there is a monument to Beaumont and in the Fort Museum there is a Beaumont exhibit.

NEW YORK

New York, N.Y. is a vast metropolitan complex, one of the largest in the world. Its origins go back to Dutch colonization in 1626, when the area was called New Amsterdam. Control passed to the British in 1664, when it was renamed New York, and at the time of the revolution it became one of the principle centers in the newly founded United States. Since then it has always played a major role in the development of the country, and in recent times a few famous institutions dedicated to the study of biology and medicine have been established there, and have played important roles.

American Museum of Natural History
Central Park West at 79th Street
New York, NY 10024

Opening Hours: Monday, Tuesday, Thursday and Friday: 10.00 - 16.45
Wednesday: 10.00 - 21.00
Saturdays, Sundays and holidays: 10.00 - 17.00
A variety of literature is available.

The museum of Natural History is today one of the foremost in the world, and has played a very important role in the progress of all modern biology.

The museum was founded in 1869 for the purpose of advancing various branches of natural knowledge. It was founded a a private institution and has remained so ever since, but is associated with the City University of New York and Columbia University, so that students from these Universities can study at the museum. Most of the research work of the museum is not normally seen by the public, and includes such areas as animal behavior, anthropology, entomology, herpetology, ichthyology, invertebrates, mammalogy, ornithology and vertebrate paleontology. Over many years the staff of the museum have played important roles in advancing our knowledge of these areas.

The displays on view for the public are extensive. All the major groups of animals, both living and in fossil form, are represented, and there are exhibits of rocks and minerals as well. The Museum also carries on active educational programs in the form of lectures, field trips, etc., and publishes a wide range of journals and magazines. Perhaps above all however, is their superb library. It is principally devoted to Natural History with some priceless rare books in the field, and is probably the best such library in North America. It is not open for use by the public except by permission of the librarian. However, visitors can ask permission to see it. Sometimes there are special displays of their rare books.

The American Museum of Natural History has something to offer everyone interested in the history of biology, and indeed a lot more.

New York Academy of Medicine
2 East 103rd Street
New York, NY 10029

Opening Hours: Normal business hours.

The New York Academy of Medicine was founded in 1847, for the purpose of promoting the science and art of medicine, the promotion of public health and medical education, and the maintenance of a library of medicine. It is a pleasure to record that through the years it has remained true to the founding functions, and has played a very important role in the successes of modern medicine, particularly in the United States.

Most of the work of the Academy is in the promotion of medicine and not directly visible, but this is not the case for their library which is certainly one of the best medical libraries in North America. There are over 500,000 volumes, with special collections, vary rare and old medical books, as well as some important original medical manuscripts. The library can be used by qualified persons with the permission of the librarian, and visitors can request to see various aspects of it. This library is priceless and continues to play an important role in the advance of medicine.

PHILADELPHIA

Philadelphia, Pennsylvania, is one of the most historic cities in the United States. It was founded by William Penn in 1682 as a city in which people of all races and religions might live together without persecution. Benjamin Franklin was closely associated with the city, and he was responsible for the founding there of many libraries and educational institutions. Philadelphia was a major focus of revolutionary activity in the latter part of the 18th century. It was here that the Constitution of the United States was drawn up, independence proclaimed, and Philadelphia subsequently became the first capital of the new country. From our point of view however, Philadelphia has also been a major center for the study and progress of medicine.

Pennsylvania Hospital
Eighth and Spruce Streets
Philadelphia

Opening Hours: Normal business hours. It is a working hospital.

This was the nation's first voluntary hospital, and was founded by Dr. Thomas Bond and Benjamin Franklin in 1751. Its purpose was solely for the relief of the "sick and the miserable," a fact commemorated in the inscription on the cornerstone of the Pine Building which was laid in 1755. The Pine Building still survives, and contains a wealth of medical history. This building is still in active use, but guided tours can be arranged by appointment through the administration. Interesting literature is available.

Originally many of the patients were insane, and the building was designed with a moat (which can still be seen). It was a popular pastime on Sundays for the "sane" to go to the hospital to marvel at the "insane," and the purpose of the moat was as a mutual barrier between the two! In the main lobby is a huge painting by Benjamin West of "Christ Healing the Sick," in which most of the major known ailments of the time were depicted. In addition there are fine portraits of early American doctors. -- Perhaps of greatest interest is the old operating amphitheatre located in the roof of the building with a glass dome. This is the oldest surviving operating theatre in the world and dates from 1804. Operating theatres of this period were always placed in the roof for two reasons. First to get the maximum amount of light, and secondly to be as isolated as possible, so that the screams of patients (there were no anesthetics) could not be heard elsewhere. Operating days were really quite an occasion. They were advertised in advance, and anybody could buy tickets to get in. The doctors had no idea of cleanliness, and even sharpened their knives on the soles of their boots. This theatre saw the introduction of anesthetics, and was in use for operations until 1868, but since then has undergone several alterations. Nevertheless it is still the original room and the visitor may ponder some of the terrible agonies suffered by patients here, and be thankful that this is no longer necessary. Elsewhere in the building are many other artifacts of medical history, including the chains used as manacles to restrain the patients.

At this hospital, there is also one of the finest historical medical libraries in the world, with holdings going back to the 15th century. It can only be used by permission of the librarian, but visitors may ask to see it.

Finally I must mention a fine statue of William Penn in the courtyard of the Pine Building, and from this courtyard the dome of the old operating amphitheatre can also be seen.

The College of Physicians of Philadelphia
19 South 22nd Street
Philadelphia

Opening Hours: Monday-Friday: 10.00 - 17.00. A wealth of literature is available. There is no charge for admission.

This College of Physicians was founded in 1787 and organized in much the same way as its British counterpart. Its purpose was to advance the science and art of medicine, and still carries on in this tradition. There are three things here which are of great historical interest, and can be seen by visitors with the permission of the secretary.

The first of the three things to see is the Mutter Medical Museum, which was patterned after the famous Hunterian Museum in the Royal College of Surgeons in London (see under London). The extensive displays in this museum basically illustrate the development of the life sciences. There is a wealth of old instruments (going back to Roman times), anatomical and pathological specimens, etc., all beautifully cared for. It is also of great interest architecturally, with its high balcony surrounding the main floor.

The other two things to see are the superb historical medical library, and the Herb Garden, newly restored. Also throughout the building are striking portraits of early American doctors.

WASHINGTON

Washington, D.C. was made the capital of the United States by an Act of Congress in 1790, and the government was transferred there from Philadelphia in 1800. It was laid out in "the grand style," and in many ways is one of the most impressive cities in the country. Apart from government, there are fortunately many major cultural institutions and I will describe some of these which are important in the history of biology and medicine.

National Museum of History and Technology
14th Street and Constitution Avenue, N.W.
Washington, D.C. 20560

Opening Hours: Daily: 10.00-17.30. A variety of literature is available. There is no charge for admission.

This is a branch of the Smithsonian Institution, a federally-chartered corporation. It carries on a great variety of scientific investigations, and has been assigned many major responsibilities by the government. The origin of the Smithsonian is of great interest. In 1826, an Englishman named James Smithson bequeathed £100,000 to the United States government to found an institution in Washington for "the increase and diffusion of knowledge among men," and the Smithsonian Institution has certainly lived up to that charge. It has become one of the great scientific institutions of the world, though its activities are by no means confined to science.

The National Museum of History and Technology is one of three adjacent museums on Constitution Avenue, the other two being the Museum of Natural History and the National Gallery of Art. What is of such significance, is that here are extensive displays in the history of biology, medicine and dentistry, and they are certainly the best in the United States. They tend to be oriented to American history in these fields, but have an international flavor as well. In describing these I can do no better than list some of the superbly designed displays:

1. Early Pharmacy
2. A United States Drugstore of 1890
3. The Development of Antibiotics
4. Early Dentistry
5. Reconstruction of dental offices and equipment of 1885 and 1900
6. A variety of historical dental instruments, and dentures worn by George Washington.
7. The Development of X-rays
8. Electricity and Medicine
9. Historical Optometry
10. The historical development of stethoscopes, opthalmoscopes, etc.
11. History of Bacteriological Research
12. History of Microscopes
13. Early Surgery
14. Surgical Milestones
15. History of Anesthesia
16. Development of Electrocardiographs

17. Rehabilitation Medicine
18. Modern Surgery

This is only a partial list, and the visitor interested in such history may spend many productive hours learning from these excellent exhibits.

The Library of Congress
10 First Street S.E.
Washington, D.C. 20540

Opening Hours: Daily: 9.00 - 18.00. There is a 45 minute tour of the library which leaves the main entrance rotunda every hour on the hour from 9.00 - 16.00 weekdays only. There is no charge for admission.

This is popularly described as "the nation's library," and is today probably the largest library in the world. Its holdings cover every field of human knowledge. It administers the copyright system in the United States and is the depository of all copyright books in this country.

It was founded by an Act of Congress in 1800, and its early holdings were primarily in the area of parliamentary government. During the War of 1812, the Capitol was burnt in 1814 and with it went the library. However the following year Congress purchased the private library of former President Thomas Jefferson (1743-1826) and this formed the nucleus from which the present library has grown. Its holdings are remarkably extensive -- "from Egyptian papyrus to microfilm."

The Library of Congress is not a library for everyday use, but rather a reference library for scholars and other libraries, but there are very interesting rooms with special exhibits. A visit to this magnificent library which has played such a major role in our whole culture is a truly thrilling experience.

The National Library of Medicine
8600 Rockville Pike
Bethesda, Maryland 20209

Before leaving Washington I just want to mention the National Library of Medicine in nearby Bethesda. Founded in 1836, it is the foremost Library of Medicine in the United States. It is with some regret that I cannot describe it from first-hand experience, as I have not been there. However, there can be no question that it is an important place for those interested in the history of medicine.

WILLIAMSBURG

Williamsburg, Virginia was one of the original settlements of the early colonists from England, and became the first capitol of Virginia. But by the early 20th century it had faded into just a small provincial town, and might have remained that way if it had not been for the farsightedness and generosity

of John D. Rockefeller Jr., who has recently restored the town to an approximation of what it was like in colonial times during the 17th and 18th centuries. It is a remarkable piece of work, and of extreme interest. There is something of historical value for everyone, including those concerned with the history of medicine.

The Apothecary Shop
Duke of Gloucester Street
Williamsburg, VA

Opening hours: Daily 10.00 - 17.00, but htere are variations depending on the season. check with the Headquarters of Colonial Williamsburg. A variety of literature is available.

The Apothecary Shop is a restoration built on its original foundations as it existed from 1760-1780. It is owned and operated by the Colonial Williamsburg Foundation and there is a sizeable charge for admission to the whole complex.

In a previous chapter (see Heidleburg, Germany) I have explained the importance of the apothecary in the development of medicine, and the drugs it employs, and here in this shop is a fine display of the "wares" of an 18th century apothecary, with a curator very willing to explain it all and demonstrate some of the techniques. The shop is divided into two parts, front and back. In the front is the apothecary's domain, but in an office at the back is a fine collection of 18th century medical instruments. These actually belonged to Dr. John Minson Galt (1744-1808), who practiced in Williamsburg during the latter half of the 18th century. They are rather grim, and include cases of instruments designed for removing stones, amputations of limbs, and trephining--a process of boring into the skull, which was supposed to "relieve pressure," and this was done without any anesthetic! All in all a visit to this Apothecary Shop leaves one with the impression that modern times have some advantages.