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THE PRESIDENT OF THE FIRST CONVENTION, CALLED TO
FORMULATE THE UNITED STATES PHARMACOPŒIA; SAMUEL
LATHAM MITCHILL, AUGUST 20, 1764—SEPTEMBER 7, 1831;
PHYSICIAN, CHEMIST, AUTHOR, SENATOR,
REPRESENTATIVE AND PROMOTER
OF THE SCIENCES.*

BY LYMAN F. KEBLER.¹

Samuel Latham Mitchill is one of the most outstanding and influential, if not the most outstanding and influential person that ever occupied the presidency or any other position connected with any convention, or any other activity, dealing with the United States Pharmacopœia. I realize that this is a very broad statement but believe that what follows will fully substantiate the assertion. I have been rather surprised to find that so little is recorded in pharmaceutical literature and that so few persons in pharmacy, chemistry, botany or the cognate sciences seem to have the remotest knowledge of the activities of this super-man, in calling attention to the frauds and impositions practiced by drug dealers, in stimulating uniformity in the manufacture of medicines, in aiding unification in the writing of prescriptions and in taking a leading part in providing the early American drug standards. Even Professor LaWall does not refer to him in his comprehensive, "Four Thousand Years of Pharmacy." Brief references to certain of the above activities will be found in the "Life of



SAMUEL LATHAM MITCHILL.

Dr. Lyman Spalding," by his grandson, Dr. James A. Spalding, 1916.

The part that Dr. Mitchill played in connection with the early pharmacopœial work in the United States, is briefly related in the 1820 or the first edition of the United States Pharmacopœia and much more briefly in the historical writeups

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of the later revisions of this authority. It is rather interesting to find that in the 1820 edition his name is uniformly spelled *Mitchell*. In a few other instances it is so spelled, but generally his name is spelled *Mitchill* and he so signed it. A goodly number of persons of note, antedating Dr. Mitchill, over a period of several centuries, spelled their name Mitchell, but no definite blood relation seems to be recorded. This also applies to the physician-chemist Dr. Thomas D. Mitchell, at times spelled Mitchill, author of a splendidly written American book, called, "Medical Chemistry," published in 1819, a year before the advent of the first United States Pharmacopœia. There is no question but that whatever spelling was used during the past century and a half in connection with the given name Samuel Latham, it had reference to Dr. Samuel Latham Mitchill.

THE EARLY LIFE, ENVIRONMENT AND EDUCATION OF DR. MITCHILL.

A number of eulogies and interesting biographical sketches (1) have been written about this remarkable man, but there is no real biography. One reason given is that a fire destroyed a vast amount of the material collected for such a biography. All of the eulogists and biographic sketchers have apparently overlooked one of the most important activities to which he turned his hand and helped to establish, an activity the importance of which has been accentuated with succeeding decades, namely, providing drug standards for the guidance of the medical and pharmaceutical professions and for the use of food and drug law enforcing officials.

In order that the readers may have available some of the events in the life, environment, character and early education of our hero, a brief summary thereof will be given here. He was born in North Hempstead, Long Island, near New York City, of Quaker parents, Robert and Mary Mitchill, the third son of a family of eight children, six sons and two daughters. He was ushered into the world during troublous times. British commercial legislation was digging a chasm between the Colonies and the mother country. The American Revolution, probably one of the greatest movements in human history, was brewing. The Navigation acts were annoying and largely flouted. The hated Stamp Act was proposed the same year that he was born and passed in 1765. This act aroused intense if not furious opposition, resulting in its repeal, to be followed later by the obnoxious Tea Act, insisted on by King George III, which act led to the Boston Tea Party, December 1773. The King became infuriated, had other obnoxious acts passed directed against the people of Massachusetts and sent an army to awe them, but they refused to be swayed from their course of action. It led to the battle of Lexington, 1775, the beginning of the American Revolution. Young Mitchill was then in his tenth year and seventeen at the end of the struggle in 1781. Apparently he did not take part in the conflict. In fact he had a frail constitution; a hemorrhagic tendency of the chest at seventeen. He adopted horseback riding for exercising and was fortunate in averting the pulmonary evil.

In educational matters Samuel was very fortunate. Any boy who is raised on a farm, managed by intelligent parents, unwittingly obtains an education that in some respects surpasses much book learning. He observes nature first hand, learns to recognize animals, plants and vegetation by actual contact. He learns the difference between weeds and useful plant life. There was no unemployment during the revolution. Everybody was required to do his bit, farmers in particular, and most of the colonists were farmers. Judging from Dr. Mitchill's interest in agriculture, botany and the other sciences in later years he profited greatly from his contact with farm life.

His maternal uncle, Samuel Latham, a medical practitioner of note, observing the industry, intelligence and keen mind of his nephew Samuel, took an unusual interest in him. In fact it is recorded that Dr. Latham had no children of his own and actually adopted Samuel. He was given an excellent classical education under the tutelage of one of the leading educators of the time. His medical education was begun under his uncle, Dr. Latham, and continued for three years under the eminent Dr. Samuel Bard, a teacher and medical practitioner, for a time the personal physician of General Washington, while the latter was maneuvering in New York City, during the revolution. In addition to the above early training and experience the embryo doctor

undoubtedly came into contact with some of the leading patriots of the time and absorbed some of their enthusiasm, determination and pluck for the cause of liberty. Among these worthy and revered souls may be mentioned Benjamin Franklin, General Washington, Thomas Jefferson, John Adams, John Hancock, Patrick Henry, Drs. Benjamin Rush, William Brown, Wm. Shippen, Jr., Andrew Craigie and others too numerous to mention.

EDUCATION AND EXPERIENCE ABROAD AND THE BEGINNING OF HIS PROFESSIONAL CAREER AT HOME.

Let us now note some of the influences under which he came and the events that transpired during his residence in the University of Edinburgh, acquiring his medical degree. His professional work in the University was started in 1783 and the medical degree conferred on him in 1786. It should be observed that the doctor spent at least six years of study in medicine to acquire his medical degree. That was one hundred and fifty years ago. He certainly should have been well equipped for his life work. The records show that he was well equipped. He was pleasant of personality, diplomatic, agreeable in manners and made many friends abroad, irrespective of the great discord just passed through between the colonies and Great Britain. He had the good fortune in the University of coming under the influence of such magnanimous teachers as Drs. William Cullen, Joseph Black, Andrew Duncan and Alexander Monro, who apparently took a special interest in their brilliant American pupil.

During his student days in Edinburgh the phlogiston theory of chemistry was in the death throes of disintegration. The work of the eminent French chemist, Antoine Laurent Lavoisier, based largely on the discoveries of other chemists, overthrew the nebulous theory of Becher and Stahl, about 1783. But Mitchill's brilliant teacher in chemistry, Joseph Black, did not see its undoing until 1791. He indoctrinated all of his pupils up to that time with the undefinable phlogiston theory. Moreover, two other noted English chemists of the time, Henry Cavendish and Joseph Priestley, who had a marked influence on the views of chemists, were purblind to the fall of phlogiston and the coming of modern chemistry. Notwithstanding the phlogiston permeated English atmosphere, in which Samuel Mitchill studied chemistry, he early became a disciple of Lavoisier and is credited with being the first to teach modern chemistry in the United States. More of the phlogiston agitation will come later.

Dr. Mitchill obtained general praise everywhere. He mingled freely with all classes. He was initiated into the unique and famous Latin Masonic Lodge of the Roman Eagle, while a student in the University of Edinburgh. On his return from Europe he was the lion of the day in medical, literary and fashionable circles. He obtained a license to practice medicine. A part of his spare time he devoted to the study of law and was admitted to the bar. Every moment he felt should be marked by some service to humanity. In 1788 he received an honorary A.M. degree from the Columbia University.

DEVOTING HIS ENERGIES TO THE PRACTICAL SIDE OF LIFE.

We now find Dr. Mitchill giving attention to the practical side of life. He analyzed the Saratoga Springs waters and enhanced their importance. In 1791 he became a member of the New York State Legislature and secretary of the Society for Promoting Agriculture, Art and Manufacturing. A year later he was appointed to the chair of Natural History, Chemistry and Agriculture at Columbia College. Here he soon taught the chemistry of Lavoisier. In 1801 he published a chemical tract on the "Chymical Nomenclature of Lavoisier." In 1807 he was chosen professor of chemistry in the newly organized New York College of Physicians and Surgeons. A year later he transferred to the chair of natural history, in which position he served until 1820, when he became professor of botany and materia medica. This position he resigned in 1826 and helped organize the Rutgers Medical College. He took great delight in the study of botany, which brought him close to nature. Dr. Mitchill was a wonderfully brilliant and successful teacher. None left his lectures empty handed. He is credited as one of the most gifted and versatile men New York State produced. Dr. Edgar F. Smith, himself a former great teacher and chemist, pays him this tribute, "Dr. Samuel L. Mitchill, whose depth and breadth of learning astonished the world."

As previously noted, Dr. Mitchill served in the New York Legislature as early as 1791.

He was then 27 years of age. Ten years later he accepted a seat in the United States House of Representatives, served as such from 1801 to 1804; served as United States Senator from 1804 to 1809; then again as a Representative from 1810 to 1813. Being a prodigious worker, unusually well informed and versatile, possessed of a remarkable memory and a polished speaker, he soon became a leader in Congress, as elsewhere. The State and National records (2) must be consulted to obtain any idea as to his activities for the general good as a public servant. Members of Congress called him the "Congressional Library," for which he labored valiantly. Others called him a "Living Encyclopedia and a chaos of knowledge." The nature of some of his labors will be found in the letters he wrote his wife from Washington, and published in *Harper's Magazine*, April 1879, nearly fifty years after passing to his reward. The prelude to the above letters is one of the most masterful and laudatory of any person, that it has been my privilege to read.

Dr. Mitchill was one of the three early physician-chemists who entered the legislative halls in America. Dr. Benjamin Rush, late in life, became a member of the Continental Congress and assumed the burdens of the times. Next came Dr. Mitchill. Dr. Adam Seybert was the third. The latter two were members of the 11th and 12th Congresses: members when war was declared on England in 1812; members when the duties on imports were doubled to raise revenues to help pay the expenses of the war. These two physician-chemists had more in common than the average Congressmen and they worked for the same objectives. They were probably instrumental in having Congress pass the act, in 1813, encouraging vaccination for small-pox (3). The thinking men of the Republic looked with great favor on both of them. They reflected great credit on their constituents and country.

THE MEDICAL REPOSITORY. THE FIRST MEDICAL SCIENTIFIC JOURNAL IN THE UNITED STATES.

Dr. Mitchill, with Drs. Edward Miller and Elihu H. Smith, established the *Medical Repository* in 1797, of which he was the principal editor for 23 years. It is considered the earliest medical scientific journal published in the United States. As a money maker it, like other scientific publications, was not a success, but it is replete with many early interesting scientific observations. In fact it is the only publication in which can be found some of the chemical and medical activities of the times. It is in this journal in which Dr. Mitchill published his observation on the frauds and impositions resorted to by drug purveyors. It was through this journal that correspondence was started in 1798, between Drs. Mitchill and Lyman Spalding, that resulted in a warm friendship throughout the life of the latter. It was in the early volumes of this journal that Dr. Joseph Priestley's last stand for phlogiston and the resulting controversies are recorded (4). The differences between Dr. Priestley and the American chemists at times became acrimonious. The chemists participating were John Maclean of Princeton, James Woodhouse of Pennsylvania and Samuel L. Mitchill of Columbia. Minister Plenipotentiary of the French Republic to the United States, P. A. Adet, also took part. Priestley himself started the phlogiston dispute on the American soil, by issuing a pamphlet entitled, "Consideration on the Doctrine of Phlogiston and the Decomposition of Water." Dr. Mitchill with rare acumen succeeded in keeping the belligerents within bounds. The surperb manner in which he handled the contending parties shows how an acute discussion on the sciences may be conducted. But Dr. Priestley remained a staunch phlogistonist to the end of his days.

In volume 20, page 329 (1820), will be found a writeup of the 1820 Pharmacopœial Convention and in volume 21, page 427 (1821), appears a very excellent review of the 1820 United States Pharmacopœia. In fact this is the only worth-while review at the time I have been able to find of this era-making book of the medical and pharmaceutical professions. The writer of the review is not given. It was probably Dr. Felix Pascalis, one of the editors.

HOSPITAL EXPERIENCE, PRESCRIPTION WRITING AND PHARMACOPŒIAL WORK.

Dr. Mitchill became physician to the New York Hospital in 1796 and served in this capacity for twenty years. He was acknowledged a sound physician at the bedside. He certainly possessed all of the qualities requisite for such work, a devout humanitarian, a patient, tireless worker and a brilliant impressive teacher. The simplicity of his prescriptions often provoked a smile on the part of his students. Shot-gun prescriptions were then in vogue. Many of them were the products of inadequate information regarding the therapeutic action of the various drugs.

Many persons practicing medicine lacked proper medical training formerly, then and years later. This was pathetically brought out during the Revolutionary War. Some of the physicians commissioned were never educated into the medical profession. General Washington characterized them as "A disgrace to the profession, the army and society." Here is what the General had in mind when he spoke so feelingly. Dr. Blank, a surgeon during a part of the revolution, was not educated into the medical profession, while he thus served. He obtained a medical degree in Edinburgh in 1786, five years after the war. It is true a number of creditable medical schools were functioning by the end of the eighteenth century and more physicians obtained their training abroad but the conditions in the practice of medicine had not improved materially over those obtaining during the revolution.

The requirements for the practice of medicine were still meagre. Dr. Spalding made inquiry of Dr. Mitchill regarding the necessary qualifications for New York. Dr. Mitchill, 1799, (5) wrote: "There is an Act of the Legislature relative to the practice of Physick and Surgery, but it is a poor stupid thing, and I believe few pay any attention to it. Two years' previous study with any practitioner and no examination required. If a person has been a student the requisite time, he will get a certificate from his master, and file it in the office of the County Clerk, and then he is a Practitioner. When I last attended the Legislature, I endeavored to obtain the repeal of a Statute which seemed to me ridiculous, and disgraceful to the Profession, but I did not succeed."

There were no books on the practice of American Medicine. To bridge this chasm physicians intercommunicated their cases with one another by word of mouth and at medical meetings. Some were published in detail in the *Medical Repository*, and others elsewhere. The Massachusetts Medical Society, in 1785, divided the Commonwealth into four districts (6) the Eastern, Western, Southern and the Middle, to encourage the reporting of medical cases.

Numerous pharmacopœias, dispensaries, formularies and medical chemistries were published in various European countries, during the sixteenth, seventeenth and eighteenth centuries. It seems that to the publishing of these kinds of books there was no end. Some of them were brought in to the colonies by the immigrants. Others were imported. They were employed by physicians, pharmacists and even the layman for the manufacture and use of medicines. There was manifestly no uniformity in the finished products. They of necessity varied with the directions prescribed by the various authors and the quality and purity of the drugs used. The case of a layman may be cited. William Penn, in 1682, brought with him, for his use and those with him an English translation of the excellent work by Johann Schroeder, entitled, "A Compleate Chymical Dispensatory in Five Books." With the advent of the Revolution the supply of imported drugs was largely restricted.

These conditions undoubtedly materially disturbed the Surgeon General and the Apothecary General of the Continental Army and those associated with them. A Government pharmaceutical laboratory, for preparing and compounding medicines, was established in the Pennsylvania Hospital in Philadelphia. This laboratory undoubtedly met some of the difficulties encountered. In 1778, was published the first American Pharmacopœia, also called a Military Pharmacopœia. No author was given. It probably was the joint product of the physicians and apothecaries enlisted in the Continental Army. A reprint appeared in 1781, under the name of Dr. William Brown, who was no longer connected with the army. It is essentially a book of prescriptions. This Pharmacopœia passed out of the picture. It apparently did not fill a general need.

AMERICAN ACTIVITIES PRESAGING A NATIONAL PHARMACOPŒIA.

Dr. Benjamin Smith Barton, before the Philadelphia Medical Society, February 21, 1798, and in 1804, in discussing certain drugs said (7): "They should have a place in the Pharmacopœia of this Country, when such a desideratum shall be supplied." A dispensatory, each, was published by Dr. John R. Coxe in 1806, and Dr. James Thatcher in 1810. At a meeting of the Massachusetts Medical Society, in 1786, the purity of drugs (6) was taken up with the view of considering the desirability of addressing the Legislature regarding some action that might be taken to prevent the sale of bad and adulterated drugs. This is the earliest consideration given the subject by a medical society in the United States. Action was delegated to the Council of the Society. Nothing further seems to have developed for nearly twenty years. In 1805 the Councilors of the Society appointed a Committee, consisting of Drs. James Jackson and John C.

Warren, to draft a Pharmacopœia adapted to the special needs of their section of the country. Efforts were made to secure the coöperation of other medical bodies in the United States without success. The Committee made its report in 1807. The Pharmacopœia of the Massachusetts Medical Society, based thereon, was published a year later. This Pharmacopœia, an excellent work, was founded largely on the latest edition of the Edinburgh Pharmacopœia.

The next movement to provide a pharmacopœia, was initiated at a meeting of the physicians and surgeons of the New York Hospital, April 4, 1815. A Committee consisting of Drs. Samuel L. Mitchill and Valentine Seaman was appointed to prepare and submit a draft. A draft was submitted October 7, 1815, examined by the Hospital Staff, somewhat amended and unanimously adopted. The Committee was directed to proceed with its publication. The book appeared in 1816 (8). This Pharmacopœia served as more than a local authority for a goodly number of years. The object of this publication was to bring about more uniformity in the quality, manufacture and prescribing of medicines. Physicians connected with the hospital, the consultants and visiting physicians, were prescribing medicines under the same or different names, that varied in character, strength and purity, depending on the formulas used in their manufacture, to the detriment of their patients, the physicians themselves and the pharmacists. English patent medicines were rapidly gaining a footing. These irregularities, variations and uncertainties were keenly felt by all concerned. The objectives were certainly laudable.

This Hospital Pharmacopœia embodies the drugs and prescriptions generally used by the above physicians and acceptable ones contained in the Pharmacopœias of London, Edinburgh and Dublin. It contains an alphabetically arranged materia medica, tables of weights and measures, signs used in prescribing, dosages, synonyms, modern chemical nomenclature, directions for manufacturing and preserving drugs and several kinds of diet, characterized as spare, common and full. There are no specific tests prescribed for determining the quality, purity or strength of the drugs used in the manufacturing operations or the finished products, excepting those inherent to the formulas themselves. It may be noted that the symbols used in prescription writing are generally employed in the directions for manufacturing medicines. More will appear about this later.

Dr. Lyman Spalding was born, bred, reared and largely educated in New Hampshire, where he established a medical practice. But he was anxious to try his hand in a large city. Dr. Mitchill on learning that his friend was desirous of engaging in practice in New York City gave him every possible advice, help and encouragement. This meant much to the younger physician. In 1813 he settled in New York City and soon built up a living practice. Dr. Mitchill helped him in making acquaintances, both professional and lay. Early in January 1817, Dr. Spalding read a paper before the New York County Medical Society (9), setting forth the needs of a National Pharmacopœia. He enumerated essentially the reasons that appeared in the New York Hospital Pharmacopœia, for its establishment. At the conclusion of the paper a committee was appointed, consisting of Dr. Spalding and some of his personal medical friends. Dr. Mitchill is first mentioned among the members by Dr. James Alfred Spalding in his "Life of Dr. Lyman Spalding." These two physician-chemists certainly worked in close harmony. Of the many duties that pressed themselves on Dr. Mitchill, he apparently was mindful of them all. In 1818 he accepted the additional duty of Surgeon General of the New York Militia.

ASSEMBLING OF DELEGATES AND CONSUMMATION OF THE UNITED STATES PHARMACOPŒIA.

The delegates of the Middle District met in Philadelphia June 1, 1819. Among them were Drs. Mitchill and Spalding and three other physician-chemists, namely, Elisha De Butts of Baltimore, Wm. MacNeven of New York and Joseph Parrish of Philadelphia. These delegates remained in session for five days and evenings, and prepared a rough draft of a proposed pharmacopœia. It must be said that this represented a vast devotion to the cause. The rough draft was sent to the Pharmacopœial Convention in Washington. A second draft was prepared by the delegates of the Northern District, who met in Boston, and likewise sent to Washington.

Six of the delegates to the first National Pharmacopœial Convention, met in the United States Chamber in Washington, Saturday, January 1, 1820, received, examined and discussed the two rough drafts submitted for a pharmacopœia. They adjourned late in the day to meet the following Monday, when five additional delegates made their appearance, among them Dr. Mitchill and two Physician Congressmen, namely, Joel Abbott and Wm. Terrel, both Representatives of Georgia. These eleven delegates spent the entire week, discussing, revising and comparing notes

on the material furnished them by the two rough drafts for a National Pharmacopœia. These eleven delegates decided on the United States Pharmacopœia and its future. Dr. Mitchill was elected President of the Convention and Dr. Spalding Chairman of the Committee of Preparation and Publication, which consisted of six members, including Dr. Mitchill as an *ex-officio* member. This committee met in New York, New Haven, Hartford and Boston. As far as the information available shows Dr. Mitchill attended all of them, excepting one in New York, when he was on duty in West Point, as a visitor appointed to the United States Military Academy by the War Department. But he wrote Dr. Spalding from West Point, sending his regrets and explaining his enforced absence. Here is a bit of humor he injected to soften the hard spots: "My function as a military man might be considered as very different from that of a medical man in our College, was there not, as the wags remark, something 'killing' in both professions."

The first edition of the United States Pharmacopœia was copyrighted December 15, 1820, in the 45th year of the independence of the United States, in the District of Massachusetts. This is the date given of its publication. In the field here under consideration, as much, if not more than in any other, progress is predicated on past performances. The vast amount of work given to the preparation of the 1820 Pharmacopœia is reflected by the improvements made in various lines. It was printed in Latin and English, on opposite pages. The handiwork of the New York Hospital Pharmacopœia is reflected on many pages and in many formulas, which one would naturally expect, from the nature of the work and with Dr. Mitchill a guiding spirit in both of them. Here are a few examples:

THE NEW YORK HOSPITAL PHARMACOPŒIA.
TINCTURA OPII.

Tincture of Opium.

℞ Hard opium powdered ʒiĵ
Proof spirit Oij
Digest seven days, and filter.

ARGENTUM NITRATUM.

Lunar Caustic.

℞ Silver ʒj
Nitric acid fʒ ĩss
Distilled water fʒiĵ

Mix the nitric acid with the water, and dissolve the silver in it by means of a sand bath; then increase the heat gradually that the nitrate of silver may be dried. Melt this on a gentle fire until the water being driven off, the ebullition ceases; then pour it immediately into proper molds or iron pipes warmed and greased with suet. Lastly, put it up in a glass phial well stoppered.

THE 1820 UNITED STATES PHARMACOPŒIA.
TINCTURE OF OPIUM.

Called Laudanum.

Take of Opium powdered, two ounces.
Diluted alcohol, two pints.
Digest for ten days, and filter.

NITRATE OF SILVER.

Formerly Lunar Caustic.

Take Pure silver, flattened into plates, and cut into pieces, one ounce.
Nitric acid, one fluidounce.
Distilled water, two fluidounces.

Mix the nitric acid and water, and dissolve the silver therein on a sand bath; then increase the heat gradually that the nitrate of silver may be dried. Melt the salt in a crucible over a slow fire, until the water being evaporated, it ceases to boil and the mass flows like oil; then pour it quickly into molds of convenient shape. Lastly, keep it in a glass vessel very well stoppered, and secured from light.

The symbol ℞ is retained in the 1820 Latin directions for manufacturing. The materia medica is divided into two parts, Primary and Secondary. Chemicals are well represented. This is to be expected. Chemistry had been forging ahead very rapidly and there were three physician-chemists, including Dr. Mitchill, *ex-officio*, on the Committee on Preparation and Publication. A large number of plant products was also included. No dosages were provided. Specific gravities are prescribed for alcohol, hydrochloric, nitric and sulfuric acids. No other tests are required for determining the character, quality or purity of the crude drugs or finished medicines, excepting as may be ascertained from the authorities referred to in the text in the case of crude plant drugs and certain preparations thereof. The two physicians connected with the preparation of the pharmacopœia and best qualified in medical botany were Drs. Jacob Bigelow and Samuel L. Mitchill.

RECEPTION OF THE FIRST EDITION OF THE UNITED STATES PHARMACOPŒIA, SOME SUBSEQUENT EVENTS CONNECTED THEREWITH AND ITS REVISION IN 1830.

That the publication was as well received as anticipated is shown by the fact that a reprint was issued in 1828. The *Medical Repository*, referred to (page 911), printed a twelve-page review, setting forth its value to physicians and apothecaries. Physicians generally testified to its merits. The Surgeon General of the United States Army, Joseph Lovell, purchased seventy copies. It did not, however, fare so well in the Navy Department. The Secretary, Hon. Smith Thompson, on June 27, 1821, regretfully wrote Dr. Mitchill and as a part thereof sent a copy of a report of Doctor Edward Cutbush, Senior Surgeon of the Navy, which reads in part (10): "I regret that I cannot give it (The American Pharmacopœia) my unqualified approbation of the work for the use of our Naval Surgeons. It contains many prescriptions which every physician ought to be capable of forming according to the age of his patient, and the effect he wishes to produce.

"I consider the Articles composing the *Materia Medica* as the tools or implements of the physician, which he is to use according to the extent of his knowledge of their virtues, guided by his medical education and experience. I have no hesitation in declaring that many of the formulæ are injudicious and others *deficient* in the important articles which render them useful, and will be so considered by many of our profession, in short, Sir, I fear the work will not bear a critical examination. Such an *order* (for the American Pharmacopœia) would probably be considered as a sanction of the work in a National Point of View."

Dr. Cutbush certainly had a right to his views, but judged by one who has had many years of Government work, along the above lines, it appears supercilious and far from making for uniformity in medicines and prescribing.

About the time the Pharmacopœia came from the press Dr. Spalding received a severe blow on his head, from a falling box of rubbish, from which he never completely recovered. In fact it was a potent factor in his death. He passed to his reward October 21, 1821. In his death Dr. Mitchill lost a devoted, life-long personal friend and his Chariman of the Committee on the Preparation and Publication of the Pharmacopœia. An obituary (11) of Dr. Spalding, unsigned, but probably written by Dr. Mitchill, reads in part: "It is with unfeigned regret that we announce the death of a worthy man and enlightened physician. He was the original projector of our National Pharmacopœia, and aided with unremitting diligence in bringing the work to its present form, but an enfeebled and shattered mind induced by chronic disease, deprived him of the cheering view of the full consummation of his labors, and the profession of one of its most worthy members."

Dr. Mitchill felt the loss grievously. He continued with his educational work but his devoted and enthusiastic pharmacopœial worker was gone. When the request came for additional copies of the 1820 Pharmacopœia, Dr. Mitchill of course felt it his duty to act. In 1828 a reprint of the original was issued. In the copyright, registered December 23, 1828, appears the following: "The Pharmacopœia of the United States of America. By the authority of the Medical Societies and Colleges. Second Edition."

It was erroneously called a "Second Edition." I looked for additional information regarding this printing but found none.

About the time the second print of the 1820 Pharmacopœia was copyrighted, the various organizations interested in its revision were either planning to ballot or had sent the results of their balloting to Dr. Mitchill, who on April 1, 1829, was required to review the ballots received and make known the results thereof. This duty he faithfully performed. But the outcome was not entirely satisfactory. In some quarters dissatisfaction developed as to the election of some of the delegates. The blame was in part put on Dr. Mitchill. This seems strange, because the Doctor was tactful and adroit in all of his dealings; a diplomat of rare ability. As one views the situation one hundred years later, it was more probably due to friction and discord in the medical ranks in the Middle District, and more particularly those in New York City and Philadelphia. This view is fortified by the fact that no Philadelphia delegates attended the 1830 Convention in New York and no New York delegates are recorded as attending the 1830 Convention in Washington. And no New York delegates attended the 1840 convention, nearly a decade after Dr. Mitchill's death. Dr. Mitchill is credited as having issued the writs resulting in the election of the delegates to the Washington Convention. At the New York Convention all four of the Districts

were represented, while in the Washington Convention all of the regular delegates came from the States South of New York and North of the Potomac River. Of the three physicians in Congress, voted as members by the Washington Convention, one came from Kentucky, another came from Maryland and the third came from New Jersey. Let us now draw the curtain on this disharmony. In fact had it not involved the hero of our story it would never have been lifted on the scene.

COMMENTS ON THE TWO 1830 REVISIONS OF THE 1820 UNITED STATES PHARMACOPEIA.

For convenience they will be called the New York and Washington revisions, respectively. The New York revision was copyrighted July 29, 1830, less than two months after the delegates met for its active revision, June 2, 1830. The revision was evidently made largely by the assembled delegates, at the time. There apparently was no special revision committee. Most of the delegates were teachers of materia medica and two included physic. One delegate, Dr. John A. Smith, was a physiologist. The *Materia Medica* portion embodies much valuable information, not contained in its predecessor. As examples let me quote several monographs, then call attention to some of the valuable added features.

ACIDUM NITRICUM.

Acidum Nitricum.

Nitric Acid. Aqua Fortis.

Prop. Liquid, colorless, transparent, fuming; taste extremely acid and caustic; odor stifling; highly corrosive, turning the skin indelibly yellow; a fluidounce should decompose an ounce of carbonate of lime.

Med. Oper. Tonic, alternative, antiseptic, escharotic. Dose, ℥ X. to ℥ XX.

Prop. means properties. Med. Oper. means medicinal operations.

ASSAFŒTIDAE GUMMI RESINA.

Ferula Assafoetida.

Assafoetida. Gum-resin.

Prop. In small irregular masses, adhering together, filled with small shining tears of a whitish, reddish or violet hue; odor fœtid and alliaceous; taste bitter and sub-acrid; soluble in alcohol and ether; forms an emulsion with water.

Med. Oper. Stimulant, anti-spasmodic, expectorant, anthelmintic. Dose grs. V. to ℥I.

CUPRI SULPHAS.

Cupri Bi-Per-Sulphas.

Sulphate of Copper. Blue Vitriol.

Prop. Crystals rhomboidal prisms, rich blue, slightly efflorescent; inodorous: taste harsh, acrid, styptic; soluble in four parts of water at 60°, and in less than two at 212°.

Med. Oper. Tonic, emetic, astringent, escharotic. Dose, as an emetic, grs. II to grs. XV; tonic, gr. 1/4.

Plant and animal products are rather fully described. Indeed too fully to quote here. Three kinds of cinchona barks are recognized. Their physical properties are clearly outlined and certain of their active principles are given. Yellow Cinchona Bark, active principle, Quinia. Pale Cinchona Bark, active principle, Cinchonina. Red Cinchona Bark, active principles, Quinia and Cinchonina. Turkish and East Indian Opium are well described and their chief alkaline substances, Morphine and Narcotine, given.

It is interesting to observe that the alkaloids quinine and cinchonine were discovered only ten years previously, while narcotine was isolated in 1803 and morphine in 1805. The commercial manufacture of quinine sulfate, in the United States, was started in 1823, and morphine and its salts in 1832.

The above certainly shows marked advancements over its predecessor, particularly in the realm of botany and chemistry. In the field of botany the leader undoubtedly was Dr. Jacob Bigelow of Boston but Dr. Mitchill was an active supporter. In the field of chemistry Dr. Mitchill stood supreme. In truth he has been declared to be the best informed and most versatile man of

science in the world of his time. I may further say that Dr. Mitchill during the course of his life became an active member of nearly all of the learned societies of the world; that his diplomas and scientific distinctions, it is alleged, might have required a team to carry away, but that in spite of all of his honors and scientific testimonials, he was accessible to everybody, young and old, at all times. There seems to be little doubt but that Dr. Mitchill must be given credit for the major part of the chemical advances introduced into the New York revision. Regarding the therapeutic advances introduced, no single delegate seems to stand out. Each one undoubtedly contributed his modicum. I cannot refrain from expressing the opinion that had proportionate advances been made in the 1840 revision, which became a standard under the 1848 drug import law, over this immediate predecessor, as the New York revision made over the 1820 United States Pharmacopœia, there would not have developed the hectic conditions that resulted from the efforts made to control the importations of spurious, inferior and adulterated drugs, under that law.

The New York revision was rather harshly criticized (12) during the course of a review. The reviewer expressed the view that severe criticism may be indulged in, in an examination of a pharmacopœia. Said he: "Not an error in a letter or a figure should be suffered to escape correction." This is indeed ideal, but during more than forty-five years of intimate contact with pharmacopœias, I have yet to meet with this ideal. The reviewer alleged that it contains gross typographical blunders; that it is too precise in some instances; that the descriptions of the properties and qualities of the drugs are too short to be of any value to the apothecary; that it inexcusably omits giving processes for obtaining the alkaline principles quinia, morphia and strychnia, processes that are described in all modern treatises on the subject; that it does avoid the gross and careless blunders that marked the 1820 Pharmacopœia throughout, due to undue haste in its preparation. This is a rather belated criticism of the 1820 edition. Dr. Mitchill, president of the 1820 Pharmacopœial Convention and the presiding officer of the 1830 Convention, seldom made any retorts to attacks involving his activities. He let his acts and works speak for themselves; no vindication needed.

The Washington 1830 pharmacopœial revision was copyrighted in 1831, in the Eastern District of Pennsylvania. It follows closely along the lines of the 1820 pharmacopœia. A new feature is methods for the manufacture of quinine sulfate, morphine, morphine acetate and morphine sulfate. Is it to be presumed that the apothecaries of a century ago were so well trained that they could execute the difficult task of manufacturing the above alkaloidal preparations? It may be said without fear of contradiction, that there are few if any retail pharmacists, for whom the Pharmacopœia was formerly intended as a guide in manufacturing, of our time, who are qualified to execute their manufacture, economically. One is bold enough to ask whether any member of the Washington 1830 Revision Committee was qualified to make these alkaloidal preparations by the methods given? It is very doubtful.

The question that would naturally arise in the minds of physicians, pharmacists, authors of materia medicas, dispensaries, etc., which of the two 1830 revisions is official, if either of them? This problem perplexed Dr. John Redman Coxe not a little, when he undertook the revision of his American Dispensatory, as is clearly shown in the preface of the 8th edition, published in 1831. The doctor uses antimony wine as an illustration to show how they differ. The New York revision directs the use of four grains of tartar emetic to the ounce of wine, the same as required by the 1820 edition, but the Washington, or the Philadelphia 1830 revision, as he chooses to call it, prescribes two grains to the ounce. He feels that these two 1830 revisions have done and will do much to disrupt the uniform system of standard prescriptions, initiated by the first or 1920 United States Pharmacopœia. In this he is on firm ground. Dr. Mitchill who had just passed on, is favorably referred to several times. Dr. Coxe considered the New York 1830 revision the superior for various reasons. The views expressed by Dr. Coxe were caustically assailed (13) by Dr. George B. Wood, a fellow townsman and a delegate to the Washington 1830 Convention. Any reader who may be interested in pursuing these distasteful, unfortunate episodes any further is kindly referred to the originals.

Now ends the story of one of the important activities of a wonderful man whose life it has been a great privilege and pleasure for me to study. In conclusion I desire to thank the staff of the Surgeon General's Library, the Department of Agriculture Library force and E. G. Eberle, for the many kindnesses rendered me in this and other investigations.

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 EARLY AMERICAN PHARMACEUTICAL INVENTIONS.*

 BY CHARLES WHITEBREAD.¹

Until a few years ago a person applying for a United States patent was required to supply a model of his invention to the Patent Office, United States Department of Commerce. These models were kept by the Patent Office and an immense number of them accumulated. When it eventually became necessary to change the phase of office procedure requiring the submission of a model with the application for a patent, there was substituted for the previous method a plan under which drawings took the place of the models.

The large collection of patent models which had accumulated through the years, and which represented practically every branch of industry, was then disposed of in various ways. Some of the models were returned to patentees or their descendants, others were transferred to the Smithsonian Institution to be exhibited in the United States National Museum and others were junked.

The patent models which reached the Division of Medicine included inventions classified under the headings of medicine, surgery, dentistry, pharmacy and nursing. All of these inventions were devised with a view to simplifying the practice of medicine. Consideration is given to a few unusual patent models of general medical interest and, in more detail, the patent models devised for use in the practice of pharmacy.

When the anesthetizing power of ether became known, physicians were confronted with the work of placing patients under its influence, a new task and one involving painstaking care and responsibility. What was more natural than to

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