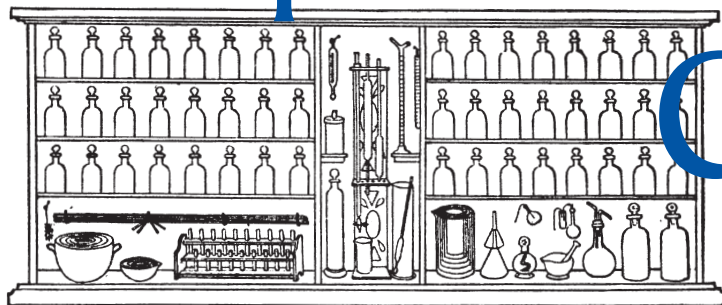


Apothecary's Cabinet



No. 9, Fall 2005

News and Notes from the American Institute of the History of Pharmacy

100 YEARS OF THE 1906 FOOD AND DRUGS ACT

The Formation and Early Work of the Drug Laboratory, USDA Bureau of Chemistry*

by John Swann**

THE institution charged with enforcement of the 1906 Food and Drugs Act, the Bureau of Chemistry, is probably best known for its efforts in regulating the food supply of the country, both when it was under the leadership of Harvey Wiley and immediately afterwards. Wiley's "overwhelming preoccupation" with foods derived from his belief that foods rather than drugs were a greater harm to the public at the time.¹ This is not to say that the govern-

ment was unmindful of adulteration and other problems associated with drugs. The 1848 drug import act charged the Treasury Department with barring adulterated drugs from entering this country. Also, from time to time beginning in the 1880s, Congress had authorized funds within the Department of Agriculture for the investigation of drugs adulterated in domestic commerce. Unfortunately, the legislative branch failed to appropriate adequate funds.²

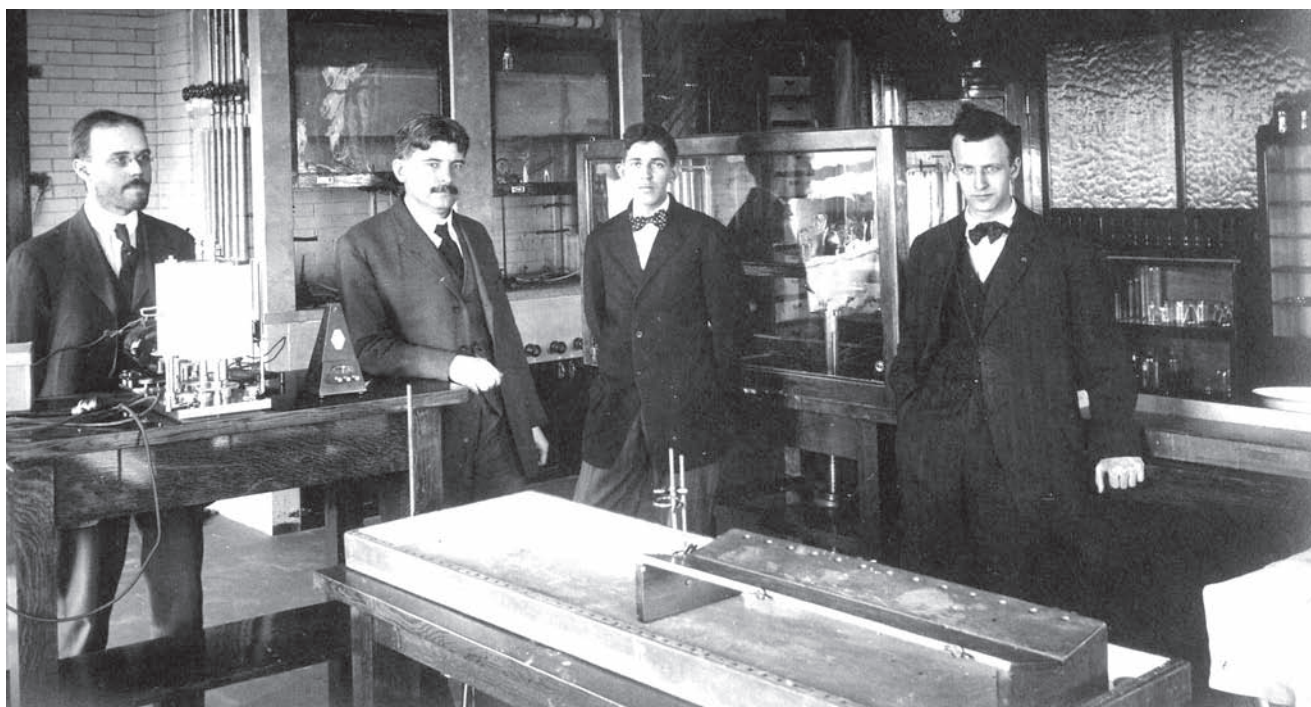
The nation's drug supply was far from safe at the turn of the century. The hundreds of brands of worthless patent medicines for self-

medication swindled people with their egregious therapeutic claims, harmed patients with such hidden ingredients as opiates, cocaine, and alcohol, and ensured their name-recognition by blackmailing newspapers into refusing to run articles critical of the nostrums. Quacks hawked worthless cures for cancer, drug addiction, tuberculosis; the few nostrums that probably did work were opiate-laden soothing syrups to quiet infants. Muckraking periodicals exposed the extent of the abuses by the patent medicine manufacturers.³

Even the so-called ethical pharmaceuticals used in regular

* Originally presented as "Science and Regulation: The Establishment of the Drug Laboratory of the USDA Bureau of Chemistry," part of the symposium, "Pharmaceutical Science and Technology," to commemorate the 50th anniversary of the American Institute of the History of Pharmacy, annual meetings of the History of Science Society and the Society for the History of Technology, Madison, Wisconsin, 3 November 1991. Presented as part of the symposium, "The Retort and the Mortar: Chemistry's Impact on Pharmacy and Drug Development," annual meeting, History of Chemistry Division, American Chemical Society, Boston, Massachusetts, 20 August 2002.

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William Salant (second from the left), Chief of the Pharmacological Laboratory, poses with J. H. Phelps, W. H. Childress, and J. B. Rieger in 1910.

medical practice, consisting principally of drugs in their naturally-occurring form, active ingredients extracted from such crude forms, and a few synthetic remedies, were frequently adulterated and of questionable potency. Investigations by the American Pharmaceutical Association (APhA) revealed, for example, that oil of wintergreen was adulterated with synthetic oils from ten percent upwards, seventy-five percent of the samples of belladonna leaf assayed below the standard amount of atropine recommended in the USP, and samples of lithia citrate were actually fifteen percent of the labeled potency.⁴

When Congressional appropriations enabled the Division of Chemistry to become a Bureau in 1901,

Wiley promised to devote attention to the assay and composition of drugs.⁵ It should have been no surprise that he turned to the APhA for assistance in planning the scope of the drug effort in the Bureau of Chemistry. The APhA had long supported increased drug control in this country. Moreover, in the same year as the Division's elevation to Bureau status, the association established a Committee on Drug Adulterations, with which Wiley hoped the Bureau could cooperate. The Committee's chief function was to survey the quality and composition of the materia medica.⁶

Wiley appeared at the 1902 annual meeting of the APhA to announce the formation of a Drug Laboratory within the Bureau of Chemistry, which the APhA Com-

Apothecary's Cabinet • No.9, Fall 2005 ISSN 1534-4509

Editor: Gregory J. Higby

Assistant Editor: Elaine Condouris Stroud

Publisher: American Institute of the History of Pharmacy, located at the University of Wisconsin School of Pharmacy,

777 Highland Ave., Madison, Wisconsin 53705-2222 Phone (608) 262-5378, email AC@aihp.org; www.aihp.org.

THE AMERICAN INSTITUTE OF THE HISTORY OF PHARMACY is incorporated under Wisconsin statute 180 as a non-profit organization devoted to advancing knowledge and understanding of the place of pharmacy in history. It publishes *Pharmacy in History*, *Apothecary's Cabinet*, occasional monographs, and pamphlets; it fosters humanistic teaching in pharmaceutical education; confers awards for outstanding achievement in its field; sponsors historical meetings and exhibits; collects and preserves source materials; and serves as a center for research and information.

PUBLICATION PRICES: *Apothecary's Cabinet* is distributed free of charge to schools of pharmacy upon request. This and other publications of the AIHP may be obtained through membership (\$50 per year for individuals, \$100 for institutions); individual copies of *Apothecary's Cabinet* are \$2.00.

mittee on Adulterations described rather hyperbolically as “one of the most important events that have transpired in the history of American Pharmacy.”⁷ Perhaps the committee was looking for an ally in its onerous task of surveying the quality of the *materia medica*! Wiley envisioned a drug laboratory that would help unify analytical methods to identify and standardize pharmaceuticals, and thereby instill uniformity on analytical results.⁸

He was echoing words spoken earlier at the same meeting. The chair of the scientific section of the APhA had detailed some of the shortcomings in the methodology of drug assay of the time. He complained that the variety of assay techniques for individual drugs had

the University of Michigan, he moved to the Philadelphia firm of Smith Kline and French, where he became chief chemist in 1892. He published over sixty papers during his Philadelphia years, most of them devoted to drug assay and adulteration. At Smith Kline and French, Kebler’s duties included inspection of drugs that the firm was considering for purchase. This experience familiarized Kebler with drug adulteration, and by the time of the formation of the Drug Laboratory he was a recognized expert in the field.¹¹

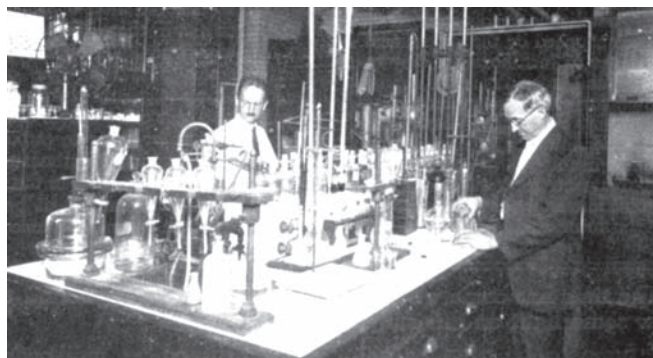
Science in major American pharmaceutical firms like Smith Kline and French at the turn of the century was quite different than the case twenty or thirty years later. New drug development or delivery, the

a different variety when they began marketing biological drugs such as diphtheria antitoxin in the 1890s.¹²

Although he received his appointment to head the new Drug Laboratory in November 1902, Kebler’s responsibilities at Smith Kline and French prevented him from assuming his position in the Bureau of Chemistry until the following March. Prior to the Federal Food and Drugs Act, the Drug Laboratory worked on a variety of topics—not all directly relevant to drugs. One of the first projects that Kebler initiated was a study of the Bureau’s own stock of reagents, primarily because this was a long-standing problem that was obviously relevant to any laboratory that relied on analytical procedures.

The Drug Laboratory exam-

Lyman Kebler (r.) and W. O. Emery are shown working in the government laboratory. This image was used to illustrate Kebler’s series, “The Mail-Order Medical Game,” published by The Druggists Circular, 1928-29.



a deleterious impact on consistent analyses. The field needed organization, he argued, someone or some institution to promote consistent methodologies for drug assays and standardization.⁹ Keep in mind that, even though some states recognized the USP as the standard compendium of drug identity, this was still prior to federal recognition of the USP as an official compendium of drug standards. Only two months earlier John Uri Lloyd—at Wiley’s invitation—had nominated this section chairman, Lyman Frederic Kebler, to head the Drug Laboratory of the Bureau of Chemistry, the institution that would play an important role in unifying these crucial elements of pharmaceutical science.¹⁰

Kebler was a likely candidate for the job. After receiving his education in pharmacy and chemistry from

hallmark of scientific research in the modern drug industry, in general was a phenomenon pertinent to the industry only after World War One. Key supporting sciences such as pharmacology and medicinal chemistry were still at a nascent stage in American universities at the time, much less in American companies. Some firms manifested a commitment to science in the form of drug standardization, a part of quality control. Parke-Davis hired chemist Albert Lyons in 1880 to standardize drugs, and within three years the company had introduced twenty chemically assayed fluidextracts. Other firms, including Eli Lilly and Company, G. D. Searle, and H. K. Mulford, also utilized science in this way. It is also worth mentioning that a few companies, led by Mulford and Parke-Davis, made use of science of

ined over 700 chemicals within two years. This effort—and the problems Kebler discovered in his survey—led the Association of Official Agricultural Chemists (AOAC) to formalize its own concern about the quality of chemical reagents as an issue of national concern. The AOAC created the Committee on the Testing of Chemical Reagents, with Kebler as head, to investigate the quality of these chemicals.¹³ A common problem Kebler observed was the labeling of a reagent as chemically pure when it was of medicinal quality, or worse. Eventually, reports of this committee became *de facto* reports of the quality of reagents at the Bureau of Chemistry, since few if any chemists outside of the Bureau were willing to assist the Committee in its work.¹⁴ In any case, the Drug Laboratory early on assumed a central role in organiz-

ing efforts to improve pharmaceutical analysis—in keeping with Wiley's original vision for the laboratory. Kebler remained in charge of chemical reagent testing for the AOAC until the 1920s.

Another cooperative venture between the Drug Laboratory and the AOAC was more directly related to drugs. In its 1903 report, the APhA Committee on Drug Adulterations questioned its ability to promote uniformity in drug standards without greater involvement by chemists. The available assay techniques resulted in significant discrepancies even when experienced chemists analyzed the same drug.

So, the Committee looked to the Drug Laboratory for help in developing analytical methods to identify drugs with results consistent among a group of chemists. At the same time, the Committee urged the AOAC to appoint a referee on medicinal plants and chemicals. Later that year, the AOAC appointed Kebler as the referee on this subject. Kebler explained why the involvement of the AOAC at this point would be helpful:

The idea of suggesting a referee in connection with the American Association of Official Agricultural Chemists is, that we take up the work on the same lines along which they have been working for a number of years, and thereby bring about uniformity of methods and results. The object is, to have the co-operation of a number of men throughout the country, . . . to bring the analytical methods that are being used by the port chemists before the public, so that we will know exactly what they are doing and thus obtain an exact guide to ascertain whether they are the best, or whether they can be improved upon.¹⁵

Kebler wanted to involve workers from many different types of institutions—pharmacy schools, universities, manufacturers, boards of health, and boards of pharmacy. Indeed, he was able to recruit assistance from an array of institutions for the early work of this AOAC committee. For the first two to three years, Kebler and his colleagues worked exclusively on assays of opium for morphine, largely because of the therapeutic importance of this drug and inconsistencies with some of the analytical methods. Kebler and ten other chemists analyzed similar samples of powdered opium

with several different methods, either pharmacopoeial assays, modifications thereof, or independent techniques. They compared similarity of results for each method, and concluded that the most recent USP assay provided the most consistent results.¹⁶

In 1905, the joint work of the Drug Laboratory and AOAC began to include other crude drugs. They compared different assays of cinchona, ipecac, and nux vomica for the principal alkaloids of each. The following year they extended the comparative analyses to include aconite, belladonna, and coca. While USP assays yielded more uniform results with some drugs, other methods had more consistent results for other drugs. For example, a group of analysts using the aconite analysis recommended by the USP experienced a fifty-one percent variation from the average for similar samples, whereas the use of another established method produced only a ten percent variation.¹⁷

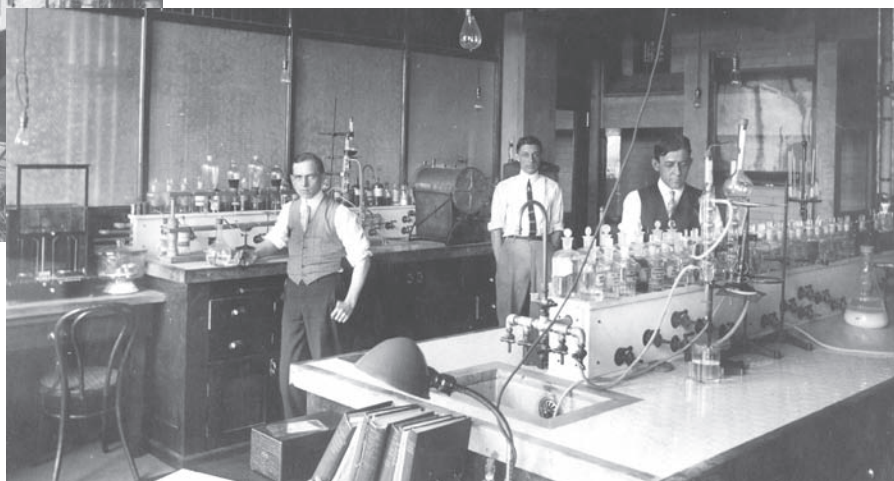
These were detailed, extremely laborious, and necessary procedures.



Researchers inside the Synthetic Products Laboratory of the Bureau of Chemistry.



The Bureau of Chemistry laboratory building (left) and the drug inspection laboratory inside (below).



From a therapeutic standpoint, a practitioner had to know how much active ingredient was in a crude drug. If a manufacturer were unknowingly using an unreliable assay method, how predictable could dosage be in such a case? From a legal standpoint, the 1906 act gave official status at the federal level to USP and National Formulary standards of identity. The Bureau of Chemistry thus had a tool for bringing actions against products whose strength, quality, or purity varied from the official standards for that drug. A loophole in the law, known as the variation clause, had some bearing here, since it permitted manufacturers to market substandard drugs as long as the variations were plainly stated on the label.¹⁸

Nevertheless, how well could

a procedure that produced erratic results hold up in a court? Official procedures had to produce results as uniform as possible. Toward this end, the Drug Laboratory tried to determine where analytical procedures were flawed. Perhaps there was a problem in the length of the maceration (steeping) period called for in a particular method for analyzing cinchona for quinine, or maybe the amount of morphine to be extracted from opium depended on the degree of agitation required for shaking out morphine during that analysis.¹⁹

The above efforts mirrored Wiley's desire that the laboratory organize analysts around the country to improve specific problems of pharmaceutical analysis and address

concerns with chemical reagents. However, the early work of the Drug Laboratory was not entirely devoted to such rigorous and technical work. Kebler publicized problems with the drug supply in a popular vein, much in the same spirit that characterized his supervisor.

The head of the Drug Laboratory drew on his experience as an analyst for Smith Kline and French when he wrote of tricks in the trade to supply spurious oils for rheumatism, phthisis, or other diseases. As long as demands existed for bat oil, mermaid's oil, rabbit oil, porcupine oil, and other such concoctions, a supplier would give the patient something, whether or not it was the genuine article. Such oils were of dubious composition as well as dubious value.²⁰

Early in his tenure as head of the Drug Laboratory, Kebler also began exposing proprietary medicines such as hair restorers, consumption cures, cures for lost manhood, and obesity cures.²¹ We will learn later that the Bureau was accused of not paying nearly enough attention to the patent medicine industry.

The character of the Drug Laboratory's work did not change immediately after passage of the 1906 act. The laboratory continued to investigate drug adulteration, perfect analytical methods, examine chemical reagents, and analyze patent medicines. Of course, after 1906 the Bureau could actually do something about adulterated or misbranded drugs. One significant change in the Drug Laboratory before and after the act concerned its organization. In 1908 it became one of two divisions within the Bureau, with four laboratories to handle different functions more efficiently. Notable as well after the Food and Drugs Act was the laboratory's concerted effort to work with several government agencies and outside organizations.

Each of the Drug Division's four laboratories had its own head. Kebler remained in charge of the Division, and in fact had risen to the number three position in the Bureau of Chemistry by this time.²² The Drug Inspection Laboratory, under George Hoover, was the laboratory most concerned with enforcement within the Division. This laboratory examined drugs seized as adulterated or misbranded under the 1906 act. Investigations of drug establishments were much more abbreviated in this early period, due to the limits of the law. Inspectors tried to obtain information about the product's formula, how it was manufactured, how it was labeled, and its distribution. From 1909 to 1910 alone, this laboratory examined over 900 drug samples from interstate commerce, over 1200 from imports, and recommended 115 samples for prosecution; comparatively few of these actually went to court. The sort of violations seen in imports was similar to that found with articles of domestic commerce, i. e., false representations on

the packaging or accompanying literature, and to a lesser extent, adulteration.²³

The Synthetic Products Laboratory was under the direction of W. O. Emery, who had investigated food and drug adulteration in Germany for several years before coming to the Bureau of Chemistry. This laboratory was responsible for examining chemical drugs and active ingredients from crude *materia medica*, and it focused on headache remedies and other preparations with habit-forming ingredients. Many of these remedies actually were mixtures of several drugs with rather different therapeutic actions, such as phenacetin, caffeine, heroin, acetanilid, antipyrine, and other compounds.

This laboratory's major research project early on was the development of techniques for quantitative determination of each of the ingredients involved. From 1907 to 1910, the laboratory was able to apply its procedures to about half of the estimated 800 brands of headache, cold, and grippe cures. Later on, Emery and his coworkers worked with other analysts through the AOAC, who confirmed that these methods produced uniform results for the amount of each ingredient in the mixtures.²⁴

The Essential Oils Laboratory focused on this group of compounds that were used therapeutically or in the manufacture of other therapeutic agents. Like Kebler, E. K. Nelson, who headed this laboratory, had worked in industry prior to coming to the Bureau. The quality of certain essential oils was especially problematical, so this laboratory developed analyses to detect adulterations in such products. Analyses required good, authentic samples of oils. For example, the synthetic product methyl salicylate often was used as an adulterant of oil of wintergreen and oil of sweet birch, because it was a fraction of the cost of these essential oils. Inspector John McManus described an interesting visit to the mountains of North Carolina around 1912 to collect some authentic oil of sweet birch for reference analytical use back in Washington:

A chemist and I went up to North Carolina and arranged with one of these distillers to make several pounds of Oil of Sweet Birch. . . . I recall the chemist was kind of nervous about the mountain people. He had heard stories about them so he brought an old pistol with him and put it under his pillow. In the morning, we were awakened by a pistol shot. One of the distillers had come in, seen the handle of the pistol, pulled it out from the guy's pillow, and shot it off to wake us up.²⁵

William Salant, a founding member of the American Society of Pharmacology and Experimental Therapeutics, was in charge of the Pharmacological Laboratory. This laboratory investigated the physiological effects of drugs and drug mixtures on animals. For example, this group performed exhaustive pharmacological examinations of caffeine and alcohol—both common ingredients in proprietary medicines.²⁶ In addition to drugs, Salant and his colleagues studied the physiological action of bleached, unbleached, and over-bleached flour, a matter of considerable concern in food regulation.²⁷

The Pharmacological Laboratory also engaged in some work on drug standardization. Chemical assays were the most common means of standardizing drugs at this time, but they were not the only way, and in fact were useless for certain products. Pharmacologists had been using biological assays in a systematic way to standardize ergot and other drugs since the 1890s. The USP requested assistance from the Bureau of Chemistry in providing to manufacturers reference standards for biologically-assayed drugs, and Wiley fully supported this idea. But the Secretary of Agriculture in 1910 refused to permit the Bureau to take on this responsibility; he argued that it was beyond the scope of the Bureau's functions under the law.²⁸ However, by the early 1920s the Bureau had reached an agreement with the Committee of Revision of the USP to supply companies with specimens of drugs assayed biologically according to USP guidelines.²⁹

Harvey Wiley strongly believed in the importance of collaborative work, with other federal agencies and with outside institutions and organi-

zations.³⁰ By 1911 the federal government employed fewer than 300 chemists, seventy percent of whom worked in the Department of Agriculture.³¹ It is not surprising then that other agencies would turn to this department—and to the Bureau in particular—for assistance with chemical analyses. The Drug Division, with experienced analysts such as Kebler, Emery, Nelson, and others, carried out much work in association with outsiders. For example, the importance of ties between the AOAC and the division with respect to analytical work has already been mentioned.

The division analyzed the composition and any therapeutic effect of many quack pharmaceuticals for the Post Office Department: alleged cures for tuberculosis, cancer, drug addiction, epilepsy, syphilis, and other nostrums. One such cure that the division investigated was Radol, an aqueous solution supposedly irradiated with radium so it would cure cancer. Division analysts revealed that it was neither radioactive nor effective against cancer. In this case the Post Office Department issued a fraud order against the business, leading to its termination. Also, the Bureau brought a successful criminal action against the firm under the 1906 act.³²

Early in 1910 George McCabe, Solicitor of the Department of Agriculture with whom Wiley occasionally had clashed,³³ accused Wiley and Kebler of failing to devote enough effort to prosecuting patent medicine manufacturers. McCabe mentioned forty-one recently purchased nostrums, all with likely fraudulent claims on their labels. But Wiley was able to show that the Bureau had under investigation, or had recommended prosecution of, all but ten of the examples cited by McCabe.³⁴

The Drug Division investigated cod liver oils for the Bureau of Fisheries, part of the Department of Commerce and Labor. From time to time in this early period of the division, chemists also handled requests for analyses from the Interior Department, Congress, and the Bureau of Printing and Engraving. Kebler

described the event when Wiley assigned him the task of analyzing different samples of glue for the latter Bureau:

[I] told ["the Big Chief"] that [I] had never tested glue and did not know anything about the subject. In reply the Boss said, "You know as much about testing glue as anyone in the Bureau." I further protested that glue was not a drug. He retorted, "Glue is certainly a drug around here and it is your job." He had shopped, without success, around the Bureau for someone to do the work, and the Drug Chief was a newcomer and the logical victim. . . . Some of my fellow chemists considered it a good joke.³⁵

The Drug Division cooperated with several components of the Department of Agriculture. For example, at the request of the Bureau of Plant Industry, they analyzed samples of hops for arsenic contamination, and they determined if the levels of barium in animal feed could account for a disease known as "loco" found in cattle. Conversely, the division sent analytical work to Plant Industry that drew upon the expertise of chemists in that Bureau.³⁶

The Drug Division worked with the Bureau of Entomology on beeswax, analyzing physicochemical properties of this substance as a function of the kind of bees involved and the location of the production. Dealers often maintained, quite incorrectly according to the Drug Division, that these factors made a difference in the quality of the product. In the process, the division improved upon pharmacopoeial tests for beeswax.³⁷ The division's work for the food commissioner of the State of Texas, on cocaine-containing soft drinks, eventually revealed that many of the brands on the market were entirely free of cocaine, yet this was present in many other samples, ranging from a trace to five-hundredths of a grain per ounce of beverage. The division consequently recommended thirteen cases for prosecution under the 1906 act.³⁸

Both Wiley and Kebler were charter members of the Council on Pharmacy and Chemistry of the American Medical Association. The AMA established this council in

1905 to evaluate patent and ethical drugs from a variety of standpoints, including composition, therapeutic claims, and advertising. Council approval or disapproval of a product determined whether or not manufacturers could advertise them in much of the professional medical literature.³⁹ Kebler's group investigated dozens of drugs for the council, especially with respect to false, misleading, and exaggerated therapeutic claims.⁴⁰ The American Pharmaceutical Association was involved with the Drug Division since Wiley's announcement at the 1902 APhA meeting. Kebler and his colleagues assisted the APhA's Committee on Drug Adulterations and the Committee on the Drug Market in the evaluation of essential oils, crude drugs, and the general nature of drug adulteration in America.⁴¹

Notwithstanding the Hygienic Laboratory of the U. S. Public Health Service, which the law charged with overseeing biological medicines marketed in the U. S., the Drug Laboratory of the Bureau of Chemistry was responsible for controlling the vast majority of the nation's supply of drugs for self-medication and prescription use. The laboratory failed to keep pace with problems in the drug supply,⁴² for many reasons, including: shortcomings in the 1906 act (which became only more pronounced with the Sherley Amendment of 1912), Wiley's preferential attention to food problems, insufficient staff in the Drug Laboratory and Drug Division, and the need of Kebler and his group to revise pharmaceutical analyses for many of the products before they could be regulated. But during this first decade of its existence, Kebler and his colleagues appeared to organize the Drug Laboratory and marshal outside assistance in as effective a manner as possible under the scientific, legal, economic, and personal constraints of the day.

³⁵Historian, Food and Drug Administration History Office, HFC-24, Room 12-69, 5600 Fishers Lane, Rockville, Maryland 20857.

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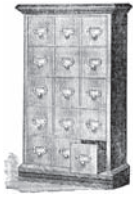
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 26. Kebler, "Division of Drugs (n. 23)," 4-[5]; untitled 54-page typescript, c. 1910 (n. 23), [43]-[46]; A. J. Lehman, "Some Functions of the Division of Pharmacology of the Food and Drug Administration," *Food Drug Cosmetic Law Journal* 8 (1953): 408; and John Parascandola and Elizabeth Keeney, *Sources in the History of American Pharmacology* (Madison: American Institute of the History of Pharmacy, 1983), 51-52.
 27. *Federal Food, Drug, and Cosmetic Law: Administrative Reports, 1907-1949* (Chicago: Commerce Clearing House, 1951), 44, 51, and Harvey W. Wiley, *The History of a Crime Against the Food Law* (Washington, D. C.: Harvey W. Wiley, 1929), 382-391.
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29. L. F. Kebler et al., "Report of Committee to Cooperate with Revision Committee of the United States Pharmacopoeia," *Proceedings of the 39th Annual Convention of Association of Official Agricultural Chemists*, Washington, D. C., 19-21 November 1923, *Journal of the Association of Official Agricultural Chemists* 7 (1924): 285-289; L. F. Kebler et al., "Report of Committee to Cooperate in Revision of the U. S. Pharmacopoeia," *Proceedings of the 40th Annual Convention of the Association of Official Agricultural Chemists*, Washington, D. C., 20-22 October 1924, *J. AOAC* 8 (1925): 280-281; and Lehman, "Functions of the Division of Pharmacology (n. 26)," 408.
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33. Harvey W. Wiley, *An Autobiography* (Indianapolis: Bobbs-Merrill, 1930), passim.
34. Untitled, 29-page typescript collection of separate Exhibits, labeled A through E, c. 1911, "Bureau of Chemistry, 1905-1912," box 200, Wiley Papers (Exhibit A: "Daggett Case;" Exhibit B: "Solicitor's Drug Samples;" Exhibit C: George P. McCabe to H. W. Wiley, 29 January 1910; Exhibit D: F. L. Dunlap to H. W. Wiley, 14 April 1910; and Exhibit E: H. W. Wiley to Secretary of Board of Food and Drug Inspection, 28 April 1910).
35. Kebler, "Division of Drugs (n. 23)," 3-4, 10; "Bureau of Chemistry: Division of Drugs (n. 32), 13-14; and Kebler, "Establishment of the Drug Laboratory (n. 2)," 382-383 (quotation).
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39. Morris Fishbein, *A History of the American Medical Association, 1847-1947* (Philadelphia: W. B. Saunders, 1947), 865-886, and James G. Burrow, *AMA: Voice of American Medicine* (Baltimore: Johns Hopkins Press, 1963), 74-75, 109-114, 117-118, and 126-128.
40. Kebler, "Establishment of the Drug Laboratory (n. 2)," 383; Kebler, "Division of Drugs (n. 23)," 2-3; untitled 54-page typescript, c. 1910, [52]; "Report of the Bureau of Chemistry, 1897-1905" (n. 14), 91; and L. F. Kebler, *The Harmful Effects of Acetanilid, Antipyrine, and Phenacetin*, Bulletin 126, Bureau of Chemistry, U. S. Department of Agriculture (Washington: G. P. O., 1909).
41. Edgar L. Patch et al., "Report of Committee on Drug Adulteration (n. 15)," 155-157; Kebler, "Opium Assaying (n. 15)," 369-375; Lyman F. Kebler, "Inferior Drugs and Insidious Methods of Deception," *Proc. APhA* 51 (1903): 332-343 (cf. idem, *Adulterated Drugs and Chemicals* (n. 14), 7-22); and untitled 54-page typescript, c. 1910 (n. 23), [51].
42. On problems with official drugs, see Sonnedecker, "Drug Standards Become Official (n. 18)," 37; For 9000 samples of six USP drugs collected in 1911, about forty-five percent were not in compliance with official standards.



In the 1950s when your radio or television was not working, the do-it-yourself handyman could take out all the tubes and carry them down to the corner drugstore. Here, usually near the front entrance, you could place the tubes in an apparatus similar to the "U-Test-M Tube Tester" shown here, to try and identify the problem. If the tube registered in the "?" or "weak" area on the strength dial, you might have to call over the pharmacist to ask what you should do. Probably buy a new tube! Until the advent of the transistor the ubiquitous tube tester held an important place in the pharmacy and generated revenue from the tube purchases—even though most radios or TVs would function quite well on a tube with only 50-60% capacity. (Photo courtesy AIHP Drug Topics Collection.)



COLLECTOR'S CORNER

GOOD HEALTH TO ALL FROM REX-ALL! I collect anything made for the Rex-all Store. Especially want early consumer products and pharmacy items manufactured by the United Drug Company (1903-46, Boston). Also Rexall AD-VANTAGES magazines, calendars, almanacs, photos, and other franchise and advertising materials. United Drug brands: Puretest, Firstaid, Elkay, Kantleek, Jonteel, Liggett's, Fenway, Harmony (cosmetics), Electrex (appliances), Old Colony (inks), Klenzo, etc. What have you? Frank Sternad, P.O. Box 560, Fulton, CA 95439; (707) 546-3106, e-mail fasternad@iscweb.com

ANTIQUE TOY MUSEUM: Located in Baltimore, North of the Inner Harbor. Museum contains apothecary shop with hundreds of pharmaceutical antiques. Anne Smith, Director. Open Thurs., Fri. and Sat., 11:00-4:00. Call for special appointments. (410) 230-0580, 222 West Read Street, Baltimore, MD.

FOR SALE: Apothecary Antiques including drug jars, apothecary bottles, manufacturing tools, medical instruments including leech jar and various dental items; books dealing with the above subjects available, catalogues issued. Always buying similar items or collections. John S. Gimesh, MD., 202 Stedman St., Fayetteville, NC 28305; (910) 484-2219.

WANTED: Show globes, fancy apothecary bottles, porcelain jars, trade catalogs, window pieces, patent medicines, and advertising. Contact Mart James, 487 Oakridge Rd., Dyersburg, TN 38024; (731) 286-2025; e-mail: kjames@cablone.net

WANTED: Books & journals on Pharmacy (pre-1920), Pharmacognosy, Herbal/Botanic Medicine, Eclectic & Thomsonian Medicine, Phytochemistry, and Ethnobotany. I will purchase one title or entire libraries. David Winston, Herbalist & Alchemist Books, P.O. Box 553, Broadway, NJ 08808, (908) 835-0822, fax: (908) 835-0824, e-mail: dwherbal@nac.net

WANTED: Philatelic items (U.S. and worldwide) related to pharmacy, drugs or medicinal plants. Interested in a wide range of philatelic items including postage stamps, advertising stamps, envelopes, postmarks/cancellations, philatelic literature relating to pharmacy. Contact Jack Chen, 7854 Calmcrest Drive, Downey, CA 90240; (909) 469-5602 or via email jackjchen@msn.com.

WANTED: Surgical related items from the 18th and 19th century. Instruments, books, etchings, photos and anything of interest. Contact Dr. Alan Koslow at koslow@mchsi.com or (515) 267-1821.

FOR SALE: Extensive antique collection: Queen Anne balance with City of New York seals, pill roller, assorted pill bottles, stone mortar believed to be 15th or 16th century. A bronze mortar, as pictured in the *Pill Rollers* (p. 65), and 20 additional brass mortars of various ages. Pictures available or may be viewed in person at Boynton Beach, FL. Contact Herb Leonard (561) 364-8967.

FOR SALE: One-hundred-year-old historical pharmacy documents containing historical signatures. A Doctor In Pharmacy certificate issued to Ephraim Shaw Tyler in 1902 and signed by Joseph P. Remington and Henry Kraemer and others and issued to Ephraim Shaw Tyler by the Alumni Association of the Philadelphia College of Pharmacy in 1902. Both are well framed. Contact Charles R. Weiss at (330) 633-4342 or CWEISS6@juno.com.

FOR SALE: Own a piece of the financial history of drug, chemical, pharmaceutical, and health care companies. Stock/Bond certificates (cancelled) are both history and an artform. Most priced under \$7.00 each. Send SASE for list. Interested in buying similar items. Wayne Segal, Box 181, Runnemede, NJ 08078. e-mail WaynePharm@aol.com

THE SNAKE-OIL SYNDROME, by A. Walker Bingham; 196 pages oversized, more than 500 illustrations, 60 pages in full color. An in-depth reference work on patent medicine advertising in the context of efficacy and the selling images used. Cross-indexed by subject and product names, with notes, bibliography, and list of public collections. Hardcover, \$44.00 postpaid from the Christopher Publishing House, 24 Roackland Street, Hanover, MA 12339.

FOR SALE: CD on Dr. Hatchett's Drug Store Museum (small town drugstore, southwest Georgia). Consisting of almost 200 pages it describes many off-the-counter medicines and patent medicines as well as other mainly early- and mid-twentieth-century products. Includes product composition, period advertising, prices, manufacturers, history, dosage, etc. Includes index by product and manufacturer. Available through Stewart County Historical Commission, P.O. Box 818, Lumpkin, Georgia 31815 for \$12 a CD. Questions may be sent to Allen Vegotsky (a.vegotsky@worldnet.att.net).

WANTED: Rennebohm prescription bottles or any Rennebohm products. Contact Beth Fisher to donate, fisher@aih.org, or 608-262-5378.

WANTED TO BUY: Eye baths or eye-wash cups with advertising (usually on the bottom) from American drugstores. Please describe embossing, color, shape, price. I am a pharmacist, collector, and AIHP member. Contact Ronald "Tracy" Gerken, 1131 Kings Cross, Brunswick, GA 31525; 912-269-2074; 1gerken@bellsouth.net.

* * * * *

The AIHP brings together those who wish to buy, sell, or trade artifacts or books related to the history of pharmacy. Free classified advertising is available to members (\$5.00 a line to non-members). Send copy to Apothecary's Cabinet, AIHP, 777 Highland Ave, Madison, WI 53705, or NOTES@aih.org.



Identity Revealed: In 1988, this photograph was published in *Pharmacy in History* as part of a series of articles on pharmaco-historical resources in Madison. Like so many of our holdings, this fascinating photograph was unidentified. While researching *Backward Glance*, editor Higby came across the photograph in the journal *Druggists Circular* (volume 74, July 1930, p. 17) with the following informative caption: “Oldest Chinese drug store in San Francisco, operated by the Oy Wo Tong family for over fifty years. One hundred prescriptions daily are filled and clerks must memorize more than 3,000 drugs.”

News

Hook’s Drug Store Museum Open

According to an article at KPCnews.com that appeared 14 August 2005, the famed Hook’s Drug Store Museum is open again at the Indiana State Fairgrounds. No longer connected with the Hook’s Discovery and Learning Center, the Museum is now operated by the Greenfield Museum Initiative. It is open Thursdays, Fridays, and Saturdays from 10 a.m. to 5 p.m. It is probably best to call ahead before visiting. Their phone number is 317/924-1503.

AIHP Joins International Society

The Institute formally became the 20th member association of the International Society for the History of Pharmacy at the recent Edinburgh Congress (22-25 June 2005). This gathering was attended by 304 delegates and their partners. One hundred and two historical papers were read on a wide variety of subjects which included studies of the historic use of drugs and medicines, pharmacy practice and the role of pharmacists through time. The next International Congress for the History of Pharmacy will be held in Seville, Spain (19 - 22 September 2007). It will be organized by the “Spanish Society of University Professors for the History of Pharmacy.” The theme is drugs and medicines from both sides of the Atlantic Ocean.

What Is It?

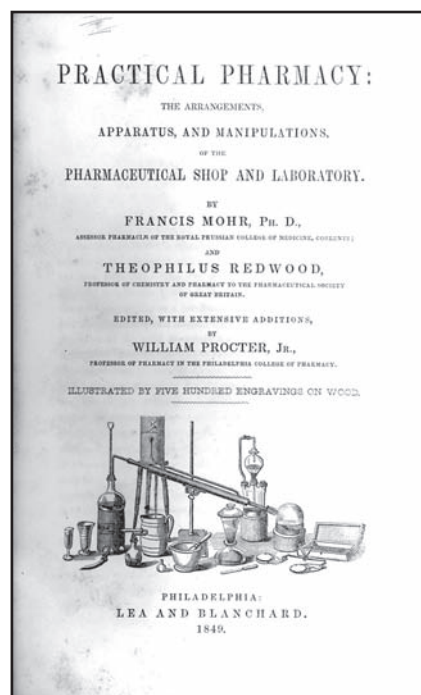


For explanation, see page 12.

Pharmacy Education in the Nineteenth Century at the Lloyd Library and Museum, Cincinnati

On display July 1 through September 30, "Pharmacy Education in the Nineteenth Century" explores the development of pharmacy education in the United States. The exhibit focuses on local history highlighting the founding of the College of Pharmacy in 1850 and its subsequent growth. Now part of the University of Cincinnati Medical Center, Cincinnati was the sixth college of pharmacy in the United States and the first west of the Alleghenies. Other local history incorporated includes John Uri Lloyd's career in pharmacy from apprentice to respected professional, as well as his establishment of the Lloyd Library and Museum. The display features resources from the Lloyd Library's book and archival collections. Nineteenth century pharmacy texts and college catalogs, photographs, rare books, and artifacts all combine to tell the story of pharmacy education in America. William Procter, Jr.'s 1849 *Practical Pharmacy* is one of the textbooks displayed. At left is the book's title page. Originally published in German by Francis Mohr and translated into English by Theophilus Redwood of the Pharmaceutical Society of Great Britain, Procter made numerous changes to reflect pharmacy as practiced in mid-nineteenth century America.

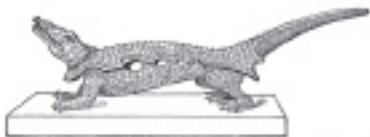
Lloyd Library and Museum
917 Plum Street
Cincinnati, Ohio 4520



What Is It?

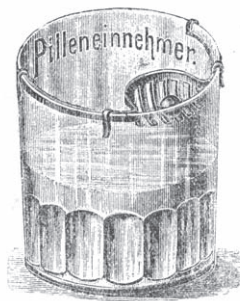
A Pharmaceutical Novelty

"The small cut shown below illustrates a simple device invented by a practical German manufacturer, which is intended to assist in that to many terrible ordeal of swallowing pills. The nickel plated basket, for such it may well be termed, is hooked onto the tumbler not quite filled with water, the instrument of torture, that is the little innocent pill or capsule, is deposited therein, and then the patient takes a big, quick swallow of water, The pill



Come to San Francisco

The AIHP will conduct its Annual Meeting program at the APhA meeting in San Francisco, March 18-20. Since 2006 is the 100th anniversary of the 1906 Food and Drugs Act, there will be a historical presentation on the topic. Please look for AIHP historical programming in the announcements from APhA.



rolls down unobserved. This little invention will undoubtedly be hailed by the pill-taking portion of humanity as a blessing and deliverer from a great evil." (*The Western Druggist*, April 1891)

Applications Invited for AIHP Grant-in-Aid to Graduate Students

The AIHP is accepting applications now through 1 February 2006 for grants-in-aid to foster graduate research (Master's or Ph.D. level).

The Institute offers grants-in-aid totaling \$2,500 to \$5,000 annually to graduate students to encourage historical investigation of some aspect of pharmacy, and to pay research expenses not normally met by the university granting the degree. Thesis projects devoted to the history of pharmacy, history of medicine, or other humanistic study strongly related to pharmacy or using a pharmaco-historical approach will be considered for all or part of the funds available.

Application guidelines can be obtained from the American Institute of the History of Pharmacy, Rennebohm Hall, 777 Highland Ave., Madison, WI 53705-2222; (608) 262-5378; email grants@aihph.org

<http://www.aihp.org/>



American Institute _____
of the History of Pharmacy

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Look for updates to our web page (www.aihp.org).
Visit the web page to locate:

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•AIHP publications, to purchase print out the order form and mail to: AIHP, 777 Highland Ave., Madison, WI 53705.

Excerpts from Publications

•Excerpts from publications: Here you can find a sample slide show on pharmaceutical trade cards, as well as PDFs of our popular publication, *Apothecary's Cabinet*. See the Table of Contents for the main articles in *Apothecary's Cabinet*.

Links

•Links to other history of pharmacy resources. Since web links are constantly changing, let us know if you know of new and useful links we could list, as well as changes to the present links.

CALL FOR PAPERS

AIHP Section on Contributed Papers at the APhA Annual Meeting 18-20 March 2006 San Francisco, California

•Titles and 200-word abstracts for 15-minute podium presentation must be received by October 1, 2005. With your abstract please include name, affiliation, address, phone number, and email address if available.

•Send abstracts to Anthony Palmieri III, AIHP Section Chair Contributed Papers:
email: ap3@ufl.edu
phone: 352-392-4903
mailing address (hardcopies): University of Florida-Gainesville, Office of Technology Licensing, Walker Hall, Box 115500, Gainesville, FL 32666

•For additional information, contact the AIHP office (608-262-5378);
email (abstracts@aihph.org).

Drachms & Scruples

Terms according to the Encyclopedia of Pharmaceutical Technology, Dekker, 2001*

*Robert A. Buerki and Gregory J. Highy, "History of Dosage Forms and Basic Preparations," *Encyclopedia of Pharmaceutical Technology*, Dekker, 2001.

Wafers: Flat sheets of rice flour used to administer nauseating drugs. When dry, wafer sheets are nonadhesive, stiff, somewhat brittle, and slightly thicker than ordinary cardboard. Powders are administered by floating thoroughly softened, passing a tablespoon underneath and lifting it out, and depositing the powder in the center and folding over the corners to thoroughly enclose the powder. If water is poured into the spoon, the concealed powder can be swallowed without any disagreeable taste being perceived. Wafer sheets are made by pouring a mixture of rice flour and water upon hot greased plates or rolling it between two hot, polished, revolving cylinders.



Tablets: Dosage forms prepared by molding or compressing medicinal substances in dies. Tablets vary widely in shape, the most common form being discoid, and range from 0.06 to 0.60 g in weight. Jean de Renou applied the Latin word *tabella* to a special type of troche in 1608; Burroughs Wellcome & Company coined the term "tablet" in 1878 to refer to its brand of compressed pills; the term is derived from the French *tablette*, meaning "shelf" and the Latin *tabula*, meaning "board."

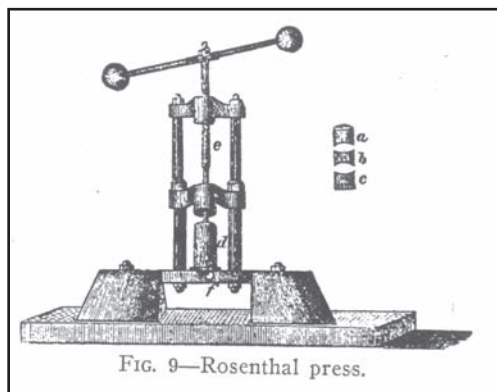
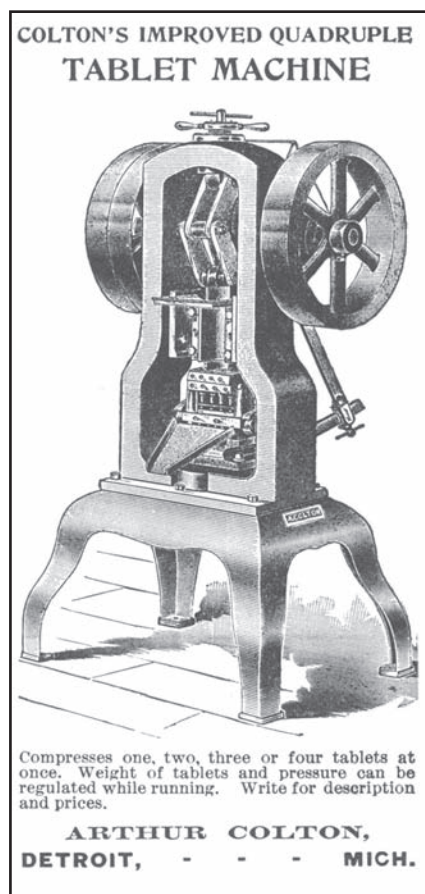


FIG. 9—Rosenthal press.

In 1843, the English apothecary William Brockedon patented a device for compressing medicinal agents commonly employed in pills and lozenges without the use of liquid adhesive agents; the resulting product was known as compressed pills. The Philadelphia druggist Jacob Dunton invented a similar device in 1864, marketing his own compressed pills in 1869; Joseph Remington devised a similar machine in 1875 to allow the retail druggist to "manufacture his own medication called for on prescription." Each of these devices consisted of a compression cylinder and lower die (to hold the medicinal substance) as well as an upper die which was struck with a mallet to compress the material. More reliable compression was achieved by using the screw devices invented by Germany's Professor Rosenthal (1874) and perfected by Austria's Carl Engler (1907). Another advancement was the lever device introduced by Philadelphia's Bennett L. Smedley (1879). The first rotary tablet machine was developed in 1872 by Henry Bower, an employee of the Philadelphia drug manufacturer John Wyeth; two years later, Joseph A. McFerran received a patent for the first fully automatic tablet machine.





A Backward Glance at American Pharmacy

EDITED BY GREG HIGBY

100 Years Ago

To those who have not installed a telephone in their stores it is suggested that they reconsider the subject seriously. A druggist needs a telephone for his own use, for his customers' use in ordering, and for the convenience of the public. The rates are such that he nets a handsome profit and has all the advantages for his own business free. By charging the regular flat price to a customer of ten cents a call, he is sure of a margin of profit on the basis of the pro rata cost of each message to him through his blanket contract for so many thousand calls. At least these conditions prevail in the East and in New York City especially. In some parts of the West the public expects by some wonderful mental process to use the drug store telephone free, but that idea is never found in the New Yorker. By having a telephone in his store and in his private residence, the pharmacist can be reached at any time, and so has an advantage over competitors in securing the business on emergency calls. The trade which a telephone draws into the store is itself considerable. This is especially true if the druggist has installed a sound-proof telephone booth. Attention to these wants of the public is sure to bring its reward. (*Pharmaceutical Era*, August 17, 1905, p. 161.)

75 Years Ago

The forty-eighth annual convention of the Alabama Pharmaceutical Association was held on the steamship "Cuba," between Key West, Florida, and Havana, Cuba. The convention party visited Atlanta, Jacksonville, Tampa and Port Tampa, where the steamship was in waiting. Four nights and three and one-half days were spent in Havana. The Pharmaceutical Society of Havana entertained the party and Cuban druggists were most gracious in their attentions. The travelers landed at Key West, Friday the 13th, on the return trip, and were entertained by the Florida association, which was in session there. (*Druggists Circular*, July 1930, p. 55.)

50 Years Ago

In unmistakable terms, the New York State board of Pharmacy has made it clear that the board no longer will tolerate the sale of aspirin in stores that do not employ a registered pharmacist. A warning was issued this fortnight by the board that all non-drug retailers in the state must "immediately discontinue the sale of aspirin tablets" or face penalty assessments for violation of a board regulation. The warning was issued following the payment of a \$100 civil penalty by a large national supermarket chain, charged by the board with making an unsupervised sale of a container of aspirin in one of its outlets. As a result of the action, the board reports that the chain is discontinuing the sale of aspirin in all its outlets in New York State. At a hearing conducted by the board, attorneys for the food chain contended that aspirin is a non-poisonous, non-deleterious and non-habit forming proprietary medicine . . . and, therefore, not restricted to sale under the supervision of registered pharmacists. Rejecting the food chain's arguments, the board ruled that aspirin tablets are not a proprietary medicine within the meaning of the state pharmacy law. (*American Druggist*, August 15, 1955, p. 12.)

25 Years Ago

The prospect of unemployment is a stark reality for many pharmacists. The problem is compounded by the movement to train and use "support personnel" or technicians. This warning was sounded by William S. Apple, Ph.D., president of the American Pharmaceutical Assn, addressing the centennial meeting of the Iowa Pharmacists Assn. Dr. Apple cited a manpower study by the Department of Health & Human Services (HHS). It showed that: This year, there are 142.6 thousand pharmacists in the US, but requirements for only 131.3 thousand. . . . Ten years from now [1990], there will be a supply of 184.8 thousand pharmacists, with job opportunities for only 158.7 thousand. "In other words," said Apple, "assuming the continued current rate of pharmacy graduates entering the profession's manpower pool, in 10 years 26,000 pharmacists are not likely to find employment in their profession. This translates into a 14 per cent unemployment rate nationwide" (*American Druggist*, August 1980, p. 64.)

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