

TEACHING THE HISTORY OF PHARMACY TODAY



Edited by
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Professor
Division of Pharmacy Practice and Administration
The Ohio State University College of Pharmacy

with a Foreword by
Gregory J. Higby
Director, American Institute of the History of Pharmacy

American Institute of the History of Pharmacy
Madison, Wisconsin
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On the Cover: The medieval triumvirate of medicine and pharmacy: Galen (129-199), Avicenna (980-1037), and Hippocrates (fl. 400 BC).

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Foreword

When I arrived in Madison in 1978 as a graduate student, I was enrolled in the history of science program. At that time, Glenn Sonnedecker and John Parascandola taught the history of pharmacy at the University of Wisconsin, utilizing a variety of teaching techniques and covering a wide spectrum of course content. At the core was the required survey course on the history of pharmacy. Yes, this two-hour course was required of all pharmacy students. This requirement ended in 1997. In addition, they taught two courses on the history of drugs (before and after 1850), a course on the development of food and drug regulation, a course on the history of use and misuse of psychoactive drugs, a course on the history of dosage forms, and occasional proseminars on various topics. After taking some of their courses and consulting Glenn and John, I transferred to the history of pharmacy program.

Courses in the history of pharmacy are great opportunities for collaborative teaching. In the class on history of food and drug control, University of Wisconsin experts on food and drug regulation were added to the roster of course instructors. Students across campus in agricultural journalism, human ecology, and other fields quite distant from pharmacy took this course. Today at Wisconsin, students from all over campus attend John Scarborough's courses on ancient and Byzantine pharmacy. No doubt courses on the history of botanical remedies would attract students on any campus.

An even wider diversity of students, as one might imagine, enrolled in the Wisconsin course on the use and misuse of psychoactive agents. Each presented a term paper based on original research. Some of these were quite original, including one showing slides of artwork done under

the influence of different psychedelics. Fortunately, the steady hand of Professor Sonnedecker kept the course on track.

Proseminars on subjects such the history of pharmacology brought in graduate students engaged in current research who had interest in their field's development. To make the old dosage forms, faculty members in the School of Pharmacy opened up their labs allowing students to run percolations, roll pills, and spread plasters. Guest lecturers and practicing pharmacists added depth to the survey course. And long before computer-based education, Wisconsin courses used elaborate multi-media lectures and the programmed learning techniques of audio-tutorial units.

The history of pharmacy offers instructors a special approach to exploring the broad scope of the pharmaceutical field. It was my special pleasure to organize the symposium in Los Angeles and hear these fine presentations. There is much here that can benefit any pharmacy instructor and we hope that this booklet will inspire others to reach our students through history.

Gregory J. Higby, Ph.D.
Director

Madison, Wisconsin
December, 1999

TEACHING THE HISTORY OF PHARMACY: YESTERDAY AND TODAY

Robert A. Buerki

"In our utilitarian and materialistic age, too little attention is given to history," Edward Kremers remarked parenthetically in an 1892 address before the APhA Section on Pharmaceutical Education and Legislation, "The professional student should at least have a fair knowledge of this history of his profession."¹ The first (1910) and second (1913) editions of *The Pharmaceutical Syllabus* recommended including a "Historical Account" in its required "Theory of Pharmacy" course.² The fourth edition (1932)--the first to outline the course of instruction for the new four-year Bachelor of Science degree in Pharmacy--set out an ambitious 32-hour required course in history of pharmacy:

The study of the history of pharmacy is worth while for its own sake. It may be taught to stimulate a professional *esprit de corps*. It certainly is deserving of consideration as a review of the past, so that we may understand the present, and thus be enabled to plan intelligently for the future.³

For many, however, the rationale for including history of pharmacy in a curriculum was the sense of professionalism such a course was supposed to instill in students. In 1936, for example, C. O. Lee wrote:

We need first of all to become thoroughly professionally minded. This will be accomplished, in part at least, by becoming imbued with the idea that the lessons of pharmaceutical history, *and its traditions*, are of value. With a true historical picture of our profession at hand we should be able to go forward with intelligence, interest and enthusiasm!⁴

By 1939, Lee could report through a temporary APhA Committee to Study Courses in the History

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of Pharmacy that almost exactly one-half of the schools and colleges of pharmacy in the nation listed either a required or an elective course in the subject.⁵ That same year, however, the *Syllabus* suffered a crushing blow when the American Council on Pharmaceutical Education suggested that its curricular guidelines be made an obligatory part of the accreditation process.⁶ The tentative fifth edition of the *Syllabus* (1942) and its revision (1945), however, contained an outline for a required 48-hour course titled “History, Literature, and Ethics of Pharmacy” the historical portion of which was intended to “create a pleasant curiosity . . . which will lead to a life-long interest in historical material.”⁷ Characterizing the proposed course as “a conglomerate kept together by some fundamental, although undefined relationship,” George Urdang dutifully developed a “select bibliography” for the unwieldy mélange just before *The Pharmaceutical Syllabus* collapsed under the weight of its own pretension.⁸

The Pharmaceutical Survey of 1946-49 explored every facet of American pharmacy; pharmaceutical education was no exception. *The Pharmaceutical Curriculum* (1952), published under the auspices of the AACP Committee on Curriculum, recommended not only including historical material in orientation courses, but also outlined a required 48-hour course in the history of pharmacy:

The history of pharmacy has . . . close relationships with the history of culture, the development of science, the evolution of the healing arts, and the improving means and methods by which man has supplied his various wants. The study of this subject provides a rich background of facts and ideas for comprehending the nature and functions of pharmacy in a modern highly developed social order.⁹

At about the same time, AACP President Arthur H. Uhl, who also served as Director of the University of Wisconsin School of Pharmacy and, not incidentally, Chairman of Council of the American Institute of the History of Pharmacy, weighed in on the issue:

The History of Pharmacy is one of the assets of the profession. We have to make use of it. It is not sufficient to leave it to the individual schools whether or not to include courses in the history of pharmacy in the curriculum. These courses must be required. Only then can we be sure that every pharmacist will be the well educated *pharmaceutical* individual we want him to be.¹⁰

In 1952, George Urdang and Glenn Sonnedecker published the first comprehensive survey of the status of history of pharmacy in American pharmaceutical education. They found that 97.1 percent of American schools and colleges of pharmacy offered courses either wholly or partly devoted to the subject, concluding that “a burgeoning interest in socio-historical study of the professions, and of civilization at large, seems to be reflected in current attitudes of administrators of pharmaceutical education.”¹¹ By the early 1960s, however, America’s schools and colleges of pharmacy were struggling to implement their new five-year curricula, and Alex Berman was more cautious:

It is possible that some day one or more schools may want to emulate Wisconsin, but at the present time there appears no basis for optimism on that score. The teaching of pharmaceutical history has probably remained unchanged in the last decade. . . .

What the future of history in pharmaceutical education will be in the extended curricula will depend on the attitude of school administrations. More than perfunctory recognition of the value of pharmaceutical history is needed to derive tangible and lasting benefits.¹²

Berman’s pessimism was soon justified. In 1963, Thaddeus S. Grosicki surveyed 48 schools and colleges of pharmacy. He found that only 77.1 percent of these institutions offered courses either wholly or partly devoted to the history of pharmacy.¹³ In 1976, the American Institute of the History of Pharmacy’s Committee on Teaching the History of Pharmacy sent a questionnaire to the deans of the 80 schools and colleges of pharmacy in the United States, Canada, Puerto Rico, and the Phillippines. The Committee, through chair Robert A. Buerki, reported that only 48.8 percent of

these institutions offered any course work that could remotely be considered as having a historical orientation.¹⁴ Buerki's findings may have prompted the Institute's Council to adopt a strong policy statement on teaching the history and social studies of pharmacy later that same year. The statement declared that the Institute should

foster curricular offerings, in each School of Pharmacy, devoted to the study of the history and social sciences of pharmacy and health care. Each subject area should be dealt with in depth, either though elective or, preferably required credits, should be supported by adequate staff and library resources, and should be recognized as a significant component of the education of a pharmacist.¹⁵

Finally, in 1981, Buerki conducted a more extensive survey of the same institutions. Of the 79 respondents, 31 institutions (or 39.2 percent) offered either required or elective course work in the history of pharmacy, 25 (or 31.7 percent) offered orientation courses that contained some historical component, and 23 (or 29.1 percent) offered no such course work.¹⁶ The data from these four surveys is presented as Figure 1* Buerki reported that the most frequently cited reason for eliminating history of pharmacy course work was ACPE-mandated curricular changes:

Something had to give, and history of pharmacy courses were vulnerable. Required courses were accorded elective status. Elective courses which did not hold up in enrollment were not offered, and subsequently were withdrawn from the catalog, often as a matter of university policy. . . . The teaching of the history of pharmacy, like wife-beating (to paraphrase Samuel Johnson), has become an amiable weakness.¹⁷

Buerki concluded by calling upon AACP, the Institute, and its Committee on Teaching the History of Pharmacy to "identify and organize teachers within the discipline and assist them to assist each other in developing new, bold, and innovative teaching methods and materials," "encourage and develop bold and innovative training programs to assure the continuity of the teaching within our

*Parenthetically, a colleague in pharmaceuticals assures me that this slope reflects a zero-order kinetics model. Extrapolation of these data allows me to predict that the teaching of the history of pharmacy will expire about 7:38 p.m., Tuesday, April 11, 2000.

Decline in History of Pharmacy Offerings in AACP-Schools and Colleges, 1952 to 1982

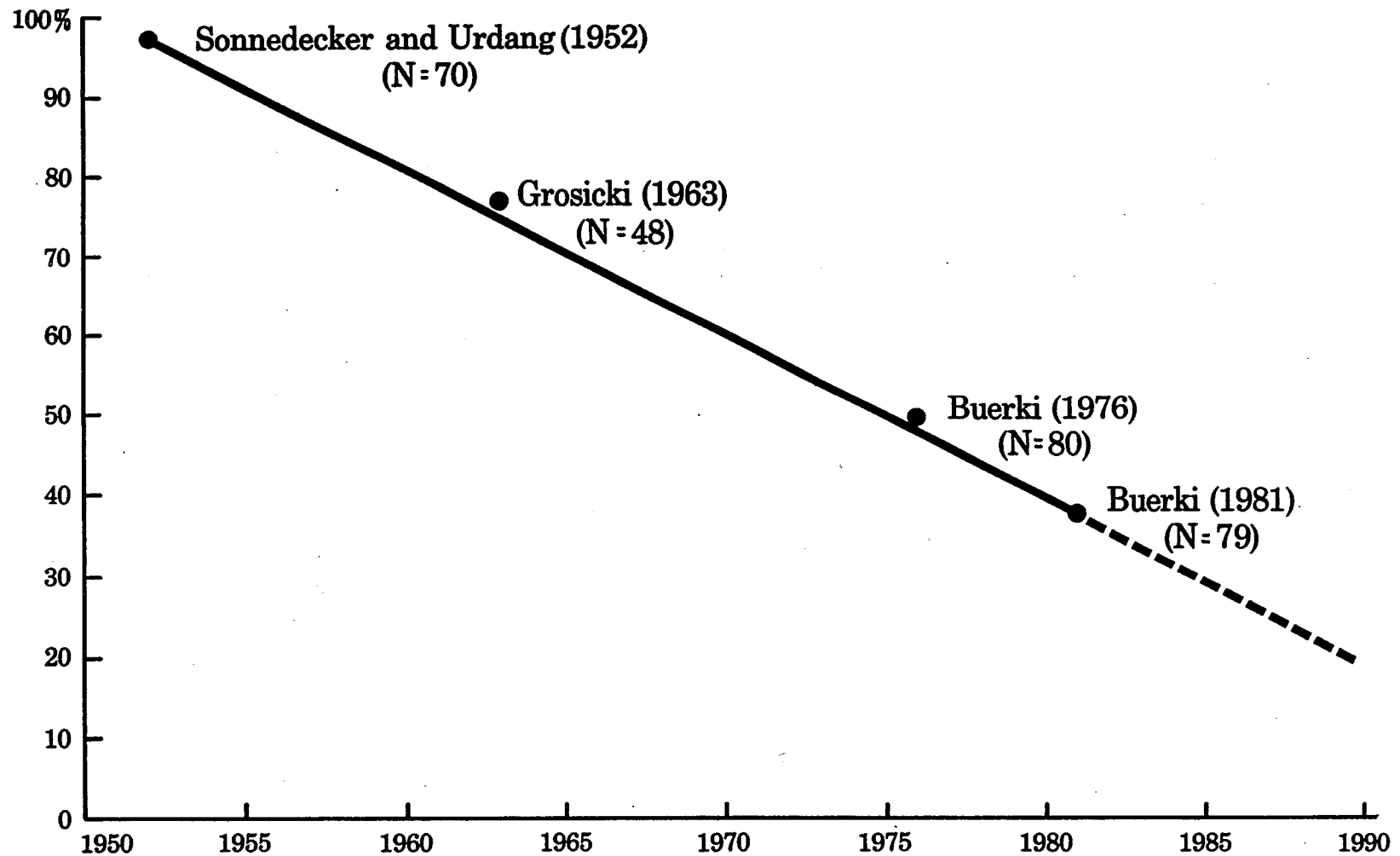


Fig. 1. Decline in history of pharmacy offerings in AACP schools and colleges, 1952 to 1982.

discipline,” and consider “a new a bold departure from traditional concepts of history of pharmacy course organization.”¹⁸ One example of such a departure is offered as Appendix A.

Committee work is not a pretty thing to watch, particularly within the Institute. In March, 1992--a full decade after Buerki's call to action--the Institute's Committee on Teaching the History of Pharmacy, rather than promoting the development of separate, stand-alone history of pharmacy courses, decided to “pursue a variety of projects which can be incorporated into basic courses in the pharmaceutical sciences or in introduction to pharmacy courses.”¹⁹ The following year, encouraged by the language in Background Paper II of the AACP's Commission to Implement Change in Pharmaceutical Education and buoyed by the adoption of an AACP resolution which supported “the inclusion of the educational outcomes, competencies and processes contained in Background Paper II in the revised accreditation standards of the American Council on Pharmaceutical Education,”²⁰ the Committee recommended the “production of a new undergraduate textbook that could be used as a primary text for a recent history of pharmacy course, a supplementary text for a survey course in the history of pharmacy, or in a pharmacy orientation course to explain how American pharmacy is practiced today.” Tentatively titled *The Evolution of American Pharmacy*, the new textbook would focus on “developments in professional practice, education, public policy, and professional functions in American pharmacy during the twentieth century.”²¹ Unfortunately, the suggestion for implementing the project--inviting authors to present a related series of papers at Institute symposia over a period of several years, which would then be gathered into an edited volume--proved unwieldy, despite two successful symposia on the “Evolution of American Pharmacy” presented at the 1994 and 1995 annual meetings of the Institute.²² Institute Director Gregory J. Higby has agreed to pursue the textbook as an individual project.

References

1. Edward Kremers, "Notes on Pharmaceutical Education: The Study of Materia Medica," *Proceedings of the American Pharmaceutical Association* 40 (1892), p. 316. "If philosophy makes the natural sciences interesting, history lends them a peculiar charm," Kremers added. "Both, I dare say, are equally important to the symmetric development of a scholar."
2. "Theory of Pharmacy," National [Syllabus] Committee, *The Pharmaceutical Syllabus* ([Albany, New York]: New York State Board of Pharmacy, 1910), p. 108; "Theory of Pharmacy, or Pharmaceutical Technique," National [Syllabus] Committee, *The Pharmaceutical Syllabus*, 2nd ed. (N.p.: n.p., 1913), p. 128. The "Historical Account" was mysteriously missing from the description of the "Theory of Pharmacy" course in the third edition (1922), possibly due to a typographical error. See "Theory of Pharmacy," Pharmaceutical Syllabus Committee, *The Pharmaceutical Syllabus*, 3rd ed. (Boston: By the Committee, 1922), p. 77.
3. "History of Pharmacy," National Pharmaceutical Syllabus Committee, *The Pharmaceutical Syllabus*, 4th ed. (Baltimore, Maryland: By the Committee, 1932), p. 76.
4. C[harles] O. Lee, "Discovering Pharmacy Through History," *Journal of the American Pharmaceutical Association* 25:10 (October, 1936), p. 872.
5. C[harles] O. Lee, "Section on Historical Pharmacy: Report of the Committee to Study Courses in the History of Pharmacy," *Journal of the American Pharmaceutical Association* 28:11 (November, 1939), p. 923. The Committee used college catalogs to secure its data.
6. [Henry M.] Burlage, "Summary of the Proceedings of the 1939 Meeting of the American Association of Colleges of Pharmacy: Report of the Committee on Pharmaceutical Syllabus," *American Journal of Pharmaceutical Education* 3:4 (October, 1939), p. 490. Also see Robert G. Mrtek, "Pharmaceutical Education in These United States--An Interpretive Historical Essay of the Twentieth Century," *American Journal of Pharmaceutical Education* 40:4 (November, 1976), pp. 351-52.
7. "History, Literature, and Ethics of Pharmacy," National Pharmaceutical Syllabus Committee, *The Tentative Pharmaceutical Syllabus*, 5th ed., mimeographed (N.p.: By the Committee, 1942), p. 12. The material included in the course also could be incorporated in other courses or divided into two parts presented during the first and fourth year of the curriculum. Also see pp. 13-17 and "History, Literature, and Ethics of Pharmacy," National Pharmaceutical Syllabus Committee, *The Pharmaceutical Syllabus*, tentative 5th ed., revised, mimeographed (N.p.: By the Committee, 1945), pp. 8-13.
8. George Urdang, "History, Ethics, and Literature of Pharmacy: A Select Bibliography," *American Journal of Pharmaceutical Education* 8:4 (October, 1944), pp. 491-503. With his characteristic thoroughness, Urdang provided history references in English, French, German,

Spanish, Italian, Dutch, Swedish, Polish, and Hungarian. See pp. 492-95.

9. Lloyd E. Blauch and George L. Webster, "History of Pharmacy," *The Pharmaceutical Curriculum: A Report Created for the Committee on Curriculum, American Association of Colleges of Pharmacy* (Washington, D.C.: American Council on Education, 1952), p. 162. "Indeed, no subject so readily lends itself to developing in the pharmacist the orientation he should have as a professional person, to producing in him a sense of appreciation for, and pride in, his profession." Also see pp. 161-63 and "Orientation in Pharmacy," pp. 156-58.
10. Arthur H. Uhl, "The President's Page: Shall History of Pharmacy be a Required Subject in the Pharmaceutical Curriculum?" *American Journal of Pharmaceutical Education* 12:3 (July, 1948), p. 569.
11. Glenn Sonnedecker and George Urdang, "A Survey on the Status of History of Pharmacy in American Pharmaceutical Education," *American Journal of Pharmaceutical Education* 16:1 (January, 1952), pp. 13 and 21. A total of 36 institutions (51.4 percent) gave a course entirely devoted to the history of pharmacy, while 32 institutions (45.7 percent) devoted part of a course to the history of pharmacy.
12. Alex Berman, "Some Notes on Teaching History of Pharmacy in the Extended Curricula," *American Journal of Pharmaceutical Education* 24:3 (Summer, 1960), pp. 283-84. Berman concluded by observing that the history of pharmacy "presents a golden opportunity to bridge the gap between narrow specialization and the humanities and to give us a greater insight into some of the most pressing contemporary socio-economic problems of pharmacy."
13. T[haddeus] S. Grosicki, "History of Pharmacy in the Five-Year Program," *American Journal of Pharmaceutical Education* 27:2 (Spring, 1963), pp. 237-38. Grosicki found 22 required or elective courses in the history of pharmacy (45.8 percent) and 15 required orientation courses in which some history of pharmacy was to be incorporated (31.3 percent). Like Lee, Grosicki used college catalogs for his data.
14. Robert A. Buerki, "Teaching the History of Pharmacy--A Preliminary Assessment," *Teaching the History and Sociology of Pharmacy*, No. 1 (May, 1977), p. 1.
15. "AIHP's Policy on Teaching Historical and Social Studies," *Teaching the History and Sociology of Pharmacy*, No. 1 (May, 1977), p. 3.
16. Robert A. Buerki, "Instructional Resources in the History of Pharmacy: Results of a Survey," *American Journal of Pharmaceutical Education* 46:1 (Spring, 1982), pp. 10-11. For a complete set of materials described in the survey, see Robert A. Buerki, comp. and ed., *Survey of Instructional Resources in History of Pharmacy Undergraduate Courses* (Columbus, Ohio: The Ohio State University, 1981), x + 160 pp.
17. Buerki, "Instructional Resources in the History of Pharmacy: Results of a Survey," p. 11. Other reasons cited for eliminating history of pharmacy course work were death or retirement

of faculty members teaching the course work, lack of student interest, and a lack of funds to support teaching the course work.

18. *Ibid.*, pp. 15-16.
19. George Griffenhagen, "Report of the 1992 Business Meeting: Teaching the History of Pharmacy: Robert A. Buerki, Chair," *Pharmacy in History* 34:4 (1992), p. 237.
20. Commission to Implement Change in Pharmaceutical Education, "Background Paper II: Entry Level, Curricular Outcomes, Curricular Content and Educational Process: Personal Awareness and Social Responsibility," AACP News, Special Report (November, 1991), pp. 17-18; and Robert A. Sandman, "Chair Report of the Bylaws and Policy Development Committee," *American Journal of Pharmaceutical Education* 56:5 (Winter Supplement, 1992), p. 14S.
21. George Griffenhagen, "Report of the 1993 Business Meeting: Teaching the History of Pharmacy: Robert A. Buerki, Chair," *Pharmacy in History* 35:4 (1993), pp. 187, 189.
22. George Griffenhagen, "Minutes of the [1995] Annual Business Meeting: Teaching the History of Pharmacy: Robert A. Buerki, Chair," *Pharmacy in History* 37:4 (1995), p. 202. In February, 1994, Griffenhagen reported that the response was "less than encouraging." By March, he was frankly discouraged and recommended that all "editorial and publishing aspects of the 'Evolution of American Pharmacy' series would be immediately assumed by the AIHP headquarters" and that "no supplemental invitations for the presentation of papers for this series at AIHP annual meetings" would be made.

Interpreting Nineteenth-Century Pharmacy Practice: The Ohio Experience

Robert A. Buerki

Village museums offer the public a unique opportunity to step back into history and view artifacts in their natural setting rather than in the artificial setting of a glass case. More importantly, costumed docents and interpreters can demonstrate the actual use of an artifact or implement, which can be an effective educational experience for village visitors of all ages. Demonstrations at such museums generally fall into two categories: domestic arts and crafts, such as spinning, weaving, sewing, or cooking; and labor-intensive trades, such as farming, printing, and blacksmithing. Middle-class occupations such as banking, teaching, and storekeeping are less often interpreted, partly because the basic functions of these occupations have changed very little over the years and partly because such demonstrations are necessarily rather static and lacking in visual appeal. The remarkable first-person interpretations at such village museums as Indiana's Conner Prairie, where interpreters actually adopt the personae of real individuals living in the 1830s, overcome these problems to a great extent, but are often unsettling to the casual visitor.

Interpretations of the health professions are especially rare, presumably because the specialized techniques and scientific knowledge associated with health professionals is as difficult to interpret as it is to acquire. The historical interpretation of the profession of pharmacy is a case in point. The objects that pharmacists of other generations have left behind give a dimension to the history of pharmacy beyond what can be conveyed by the written word. Such artifacts are studied for what they tell about how the pharmacist worked, the development of pharmaceutical technology, and the evolution of modern drug therapy. This three-dimensional lore of the apothecary—at once nostalgic, curious, and beautiful—has a strong and intensely personal appeal for the average visitor to a museum village. Nonetheless, very few museum villages can boast of an apothecary shop, a fact that reflects the difficulties involved in providing

adequate historical interpretation of such a specialized field.

One way to overcome this problem is to establish links between museums and colleges of pharmacy. If museums provide the artifacts and physical setting, pharmacy students and professors can bring their expertise to bear in building a effective interpretive program. Such cooperative programs are uncommon to say the least, although those museums located near one of the 83 colleges of pharmacy in the United States and Canada have a ready resource of professional support at their disposal. Few of these institutions have an expert on historic pharmacy practice on staff, but most would be interested in helping a museum develop a program in this field. In the absence of such resources, museums might approach a retired pharmacist in the community for assistance in presenting the history of pharmacy. In 1955, no less than thirty apothecary shop restorations were being exhibited across the United States; at present, there are more than 146 medico-pharmaceutical museums or exhibitions that are on special or semipermanent display and open to the public in the United States and Canada.¹

Only a few of these are located in museum villages in the United States² and Canada,³ but only a handful offer the opportunity to interact with interpreters who have extensive training in historic pharmacy practice. The Pasteur-Galt Apothecary Shop of Colonial Williamsburg, Virginia, was established in 1760 by apothecary-surgeon William Pasteur, who was joined in 1775 by physician-surgeon John Minson Galt. The pharmaceutical equipment of the shop—including rare Delft drug and leech jars, imported medicines and elixirs, and a late eighteenth-century balance—is documented as typical of the period 1760 to 1800. The shop is interpreted by costumed docents who discuss the medico-pharmaceutical practices of the colonial period. Although they get a good general education in the history of medicine of the period, these interpreters have little, if any, training in

pharmaceutical manipulations.⁴ The meticulous restoration of a pharmacy operated at Niagara-on-the-Lake since 1866 and at other locations since 1820, features the original butternut and walnut fixtures, plaster ceiling rosettes, crystal gasoliers, and many of the original drug jars brought from England as early as the 1830s. While not part of a museum village, the Niagara Apothecary is interpreted during the summers by pharmacy students who receive special training in the history of pharmacy and nineteenth-century dispensing techniques at the University of Toronto Faculty of Pharmacy.⁵ The recent cooperation between the Ohio Historical Society and The Ohio State University College of Pharmacy in developing a program for the restored pharmacy at Ohio Village provides an example of how more lively and informed interpretations of this and other specialized professions might be developed at historic sites.

Ohio Village is a reconstruction of a typical Ohio county seat of the 1800-1860 period. It features costumed craftsmen plying their trades with the tools and methods of their forefathers. Opened in 1974 on a ten-acre site adjacent to the Ohio Historical Center in Columbus, the open-air museum features a blacksmith, weaver, gunsmith, cabinetmaker, tinsmith, and printer. Visitors browse through the town hall, a physician's office and home, and a general store, where many of the craftsmen's products are available for sale, and then relax at the Colonel Crawford Inn, where they can enjoy authentic nineteenth-century fare.

Although a "drug store" was included in the original plans for the museum, the Ohio Village Pharmacy did not materialize until a decade later. Representatives from the Board of Trustees of the Ohio Historical Society contacted the Ohio State Pharmaceutical Association (OSPA) to seek its sponsorship for the pharmacy, following a pattern the Society had found successful in attracting sponsors for other attractions at Ohio Village. Unfortunately, although the OSPA was sympathetic to the project, it could not commit the funds required by the Society to build, furnish, and operate the Pharmacy on an ongoing basis. As a result, when Ohio Village opened its gates for the first time in the fall of 1974, it did so without a pharmacy in place.

Shortly thereafter, the Society established a professional development council to assist in locating sponsors and contributors for Ohio Village. The failing health of the individual assigned to the pharmacy project made it difficult for him to make much progress, so in 1975 the

Society tried a new approach. It formed a task force composed of representatives of the OSPA, the Ohio Society of Hospital Pharmacists, the Ohio State Board of Pharmacy, the colleges of pharmacy at Ohio Northern University and The Ohio State University, and the pharmaceutical industry. While representing nearly every facet of Ohio pharmacy practice, the task force also represented a wide diversity of opinion on the best method for achieving success on the project. The Historical Society preferred working with one or two major donors, whereas the task force felt that a grass-roots appeal to individual pharmacists through a "friends" group organized specifically for that purpose might achieve the same results. Later that same year, the Historical Society established a development office to spearhead a fund-raising campaign for the pharmacy project through pharmaceutical associations, manufacturers, and private foundations. Yet despite its best efforts, the Society was able to raise only about \$1,300 during the first two years of its campaign. Finally, in 1983, in anticipation of the centenary of the Ohio State Board of Pharmacy, a new non-profit corporation was formed by past members of the Board to promote the profession of pharmacy in the state of Ohio. Happily, the first project the Ohio Society of Past Board Members chose to promote was the Ohio Village Pharmacy. Since 1983, the OSPBM has raised nearly \$72,000 for the project, including a grant from the Columbus Foundation and a major donation from Merrell-Dow Pharmaceuticals of Cincinnati.⁶

The magnificent mahogany fixtures dominating the pharmacy were custom-built in 1887 for pharmacist Charles Bulfinch of Lynn, Massachusetts, a descendent of the famous American architect of the same name. The ornately carved fixtures feature a full-length mirror and stained-glass windows; undisplayed items include a grandfather clock and unique metal bas-reliefs of Asclepius, the ancient Greek god of the healing arts, and Hermes (or Mercury), the messenger of the gods who is associated with science and commerce in both the Greek and Roman traditions. The fixtures were in daily use until 1955, then stored for two decades by Massachusetts pharmacist Philip McAuliffe, who donated them to the Historical Society in 1975 at the suggestion of Dr. Glenn Sonnedecker, Director of the American Institute of the History of Pharmacy. The drug jars, patent medicines, and other antique pharmaceutical equipment reflect the resources of the Society's historical collections as well as a major collection of over 4,000 pharmaceutical antiques and artifacts assembled by Robert

J. Prunchak of Buffalo, New York, and donated to the Society by Merrell-Dow Pharmaceuticals of Cincinnati.⁷ The pharmacy also features a raised demonstration area fitted with gas fixtures and a hidden sink. The demonstration area is used by both Society interpreters and student volunteers from The Ohio State University College of Pharmacy who discuss nineteenth-century materia medica and therapeutics with visitors to the pharmacy, and recreate in an authentic manner the dosage forms employed by early American pharmacists. This program represents a unique cooperative agreement between two state educational agencies.

Perhaps the most unusual aspect of this collaboration was the College's development of two new elective courses in the history of pharmacy. The selected upper-division pharmacy students who complete these courses have an opportunity to demonstrate nineteenth-century compounding and dispensing techniques to visitors of the Village Pharmacy on a regularly scheduled basis. Dressed in period costumes and using authentic antique pharmaceutical equipment, textbooks, drug compendia, and crude drugs of the Civil War era, the students demonstrate the preparation of products prescribed by nineteenth-century physicians and highlight the pivotal role the American pharmacist has played in maintaining public health.

Students interpreting nineteenth-century pharmacy practice at the Ohio Village Pharmacy take two formal courses in the history of pharmacy as preparation: Pharmacy 513, a three quarter-hour survey course tracing the development of the profession from antiquity to present-day practice, and Pharmacy 694.01, a two quarter-hour course which provides students with an in-depth knowledge of pharmaceutical practices of a century ago as well as an increased appreciation of their professional heritage. The course operates on three levels. Weekly lectures concentrate on medical theories, drug therapy, and pharmacy practice in mid-nineteenth-century America; outside readings trace the development of representative classes of therapeutic drugs during the period 1850 to 1920; and laboratory exercises allow students to understand the work of the pharmacist before the rise of modern pharmaceutical science and technology.⁸

During their first week of class, for example, students learn in lecture of the harsh realities of life in colonial America. They hear about the drastic "heroic" therapies advocated by late eighteenth-century and early nineteenth-century physicians, which consisted of copious bleedings supplemented

by violent—and sometimes fatal—purges and emetics. Lectures also cover the popular alternative treatments provided by uneducated herbalists, hydropaths, and other self-styled practitioners, who reflected the self-sufficiency and egalitarianism of the age of Jacksonian democracy. The students read of the mid-nineteenth-century pharmaceutical apprenticeship experiences of one of America's most remarkable pharmacists, John Uri Lloyd. They become acquainted with the standards of pharmaceutical practice advocated by the so-called "Father of American Pharmacy," William Procter, Jr., in the 1849 edition of his classic *Practical Pharmacy*, the first pharmacy textbook in English intended for an American audience. Reading from primary sources whenever possible allows students to pick up many of the nuances associated with mid-nineteenth-century pharmaceutical practices. During their first laboratory period, students practice writing out prescription labels using steel-nibbed pens, make up the paste used to adhere the labels to antique prescription vials, cork the vials using corks compressed in a cork press, and tie the corks to the vials using a "pharmacist's knot" (see Plate 1).⁹

During subsequent lectures, students learn about homeopathic and eclectic medical sects, the popular health reform movements from the 1830s to the 1870s, the medical contributions of the American Indian, the introduction of the germ theory of disease, and the professional development of American medicine and pharmacy, including education and licensing standards. During subsequent laboratory periods, students learn to identify drugs by their distinctive physical appearance and taste as well as by their microscopic botanical characteristics. They then prepare a wide variety of authentic nineteenth-century dosage forms, including pills and powders, infusions, tinctures, wines, spirits, extracts, syrups, distilled oils, waters, lozenges, troches, liniments, cerates, and plasters.¹⁰

Students put their newly acquired skills to work by concurrently registering for Pharmacy 694.01, a one quarter-hour practicum designed to provide them with the opportunity to discuss the work of the typical, small-town, nineteenth-century American pharmacist with the many visitors the Ohio Village Pharmacy attracts. Dressed in period costumes, the students spend between six and ten hours a week preparing authentic dosage forms and communicating therapeutic information of a bygone era to visitors. In addition, students are expected to prepare a one to two-page report each week on a nineteenth-century drug and its use, a

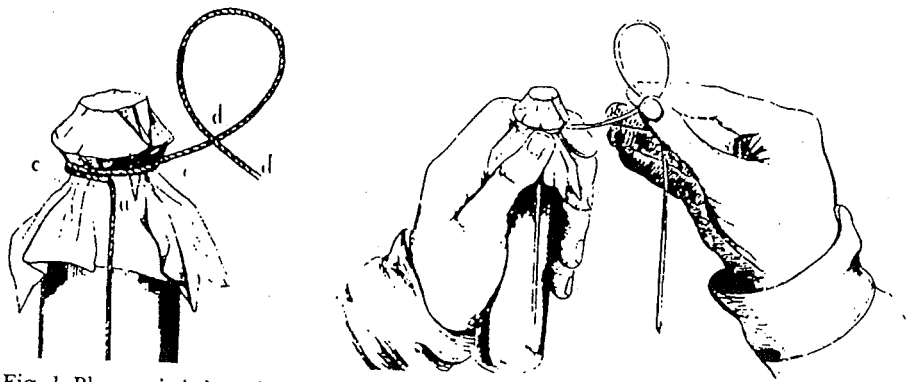


Fig. 1 Pharmacist's knot for capping a dispensing bottle. Reprinted from Francis Mohr and Theophilus Redwood, *Practical Pharmacy*, ed. William Procter, (Philadelphia: Lea and Blanchard, 1849)

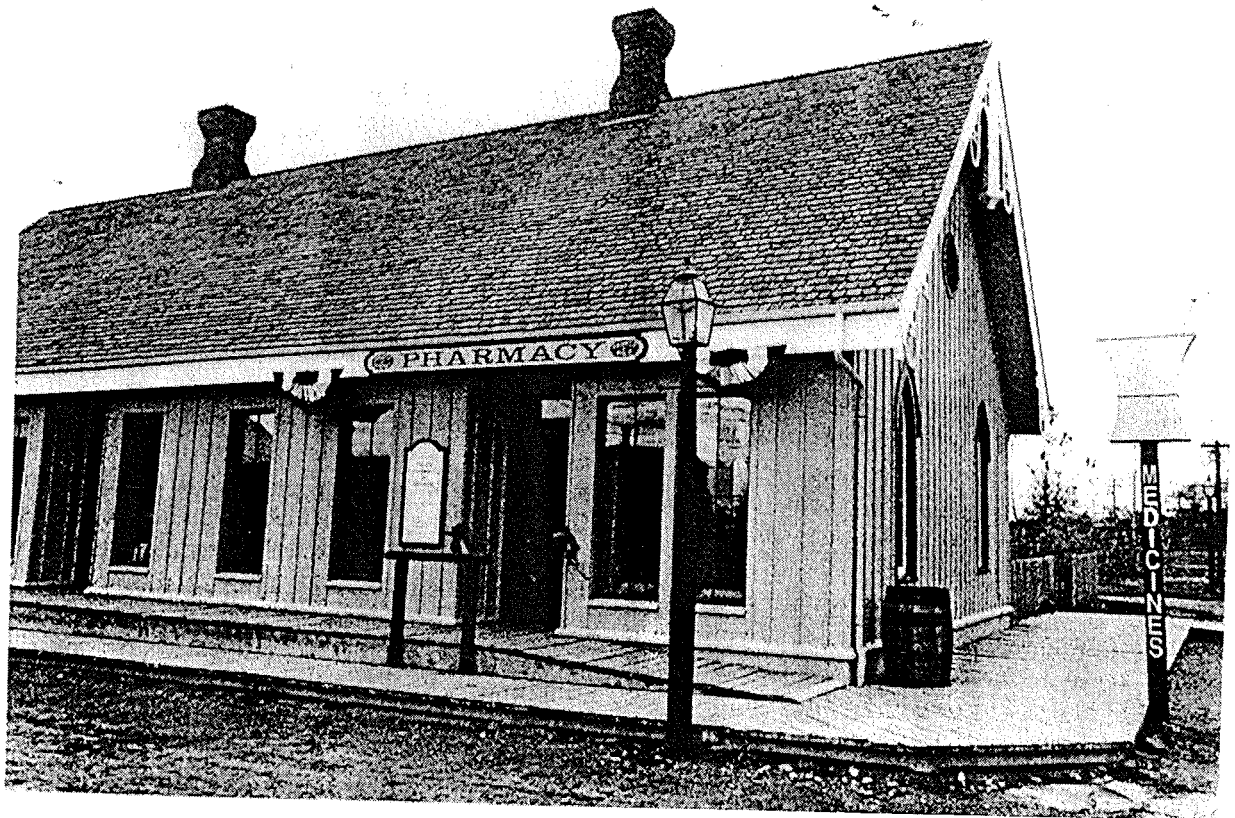


Fig. 2 The Ohio Village Pharmacy, located on the grounds of the Ohio Historical Society in Columbus, reflects the practice of pharmacy in a typical small town in Ohio during the 1870s. Note the wooden sidewalks and the mortar-and-pestle shop sign.



Fig. 3 Ohio Historical Society interpretive specialists Susan Brouillette and Michael Follin are two of over a dozen craftpersons and museum professionals who provide a lively and informative interpretation of nineteenth-century pharmacy practice at the Ohio Village Pharmacy.



Fig. 4 Robert A. Buerki (left) demonstrates a nineteenth-century dispensing technique to pharmacy student Barbara Grajzl at The Ohio State University College of Pharmacy while Professor Larry W. Robertson (right) prepares a drug plant identification exercise using a microscope.

Figure 1

STUDENT REPORT

- Preparation: Pilulae Aloes (Pills of Aloe), USP V, p. 242
- Formula: Socotrine Aloes 48 gr. Reduced: 24 gr. Dose: 2 gr.
 Soap 48 gr. 24 gr.
To make: 24 pills 12 pills
- Active Ingredient: Socotrine Aloes, "the inspissated juice of the leaves of Aloe Socotrina" (ibid., p. 16).
- Description: Succulent plants belonging to the Lily family, indigenous to East and South Africa, with numerous, persistent fleshy leaves. "If the leaf of an Aloe be separated from the parent plant, it may be laid in the sun for several weeks without becoming entirely shrivelled; and even when considerably dried by long exposure to heat, it will, if plunged into water, become in a few hours plump and fresh" (Grieve, p. 28).
- The drug consists of the liquid exuded from the leaves, evaporated to dryness. Plants must be at least two to three years old to yield the juice. The leaves are cut off close to the stem and placed in tubs and allowed to drain. The juice is concentrated by boiling to the consistency of thick honey ("inspissation"). Upon cooling, it is placed into gourds or goat skins and allowed to solidify.
- Socotrine aloes are dark, reddish-brown masses almost entirely soluble in alcohol, not more than 50% soluble in water, and should not yield more than 3% of ash. Samples which are nearly black are unsuitable for pharmaceutical purposes.
- Medicinal Use: One of the "safest and best warm and stimulating purgatives to persons of sedentary habits and phlegmatic constitutions" (ibid.). An ordinary small dose takes from 15 to 18 hours to exert its effect. Its action is exerted mainly on the large intestine, for which reason it is also useful as a vermifuge. Prolonged use of aloes is said to induce piles.
- Preparations of aloes are rarely prescribed alone; they require the addition of carminatives to moderate the tendency to griping. "Aloes in one form or another is the commonest domestic medicine and is the basis of most proprietary . . . pills" (ibid., p. 29).
- Aloes is also used as a purgative for horses; it is also used in veterinary practice as a bitter tonic in small doses and externally as a stimulant and desiccant.
- Other Uses: The soft extract combined with wood ash is used by the natives of Jamaica as a substitute for soap; the leaves may be used for polishing pewter; the decayed spongy substance of the leaves may be used as tinder; the fibers may be spun into thread; the leaves may also be used to produce a violet dye which does not require a mordant to fix it.
- Source: M. Grieve, A Modern Herbal (1931; rpt. New York: Dover Publications, Inc., 1971), pp. 26-29.

Figure 2

INTERPRETATION SCRIPT

We're making aloe pills this afternoon in the manner of the pharmacists of the 1870s. Many of you have identified this aloe vera plant, which is native to eastern Africa and Egypt. To harvest the aloe, the natives would cut off the leaves of the aloe plant, allow the juice to drain out, and boil this juice to the consistency of a thick syrup. They would then pour the juice into a gourd, goatskin, or other convenient container, and allow it to thicken and harden into the lumps we see here. Drug adulteration was a major problem for the pharmacist of the nineteenth century, and for this reason, he preferred receiving drugs in their raw or native state so that he could check them for adulteration or tampering.

The pharmacist would take his imported lumps of aloe, grind it into a powder with his mortar and pestle, and mix it with an equal quantity of grated soap, using his balance for accuracy. He would then mix the powdered aloe and soap with a very few drops of water to form a pill mass, much the consistency of putty [or chewing gum]. He would then roll the pill mass on his pill tile to form a long cylinder called a pill pipe, the length of which would be determined by the number of pills in the formula or prescription. We're making twelve pills, so the pill pipe would be rolled out to the "12" mark on the pill tile. The pharmacist would then cut the pill pipe into twelve equal segments with his spatula, roll each into a sphere [or ball], polish it with is pill finisher as I'm doing here to give it a sheen, and dispense it in a pillbox with lycopodium powder to keep the pills from sticking together. Aloe pills were an excellent laxative, and two of these pills would produce a laxative effect in about 12 to 15 hours. Folks in the nineteenth century didn't eat the balanced diets we eat today--lots of meat, but very little fruit, vegetables, or roughage. For this reason, many of them suffered from chronic constipation and found relief in aloe pills and other popular laxatives of the day.

Some pharmacists also coated their pills with gold or silver, such as the silver-coated pills you see here. This was done for two reasons: first, it produced a very elegant appearance which was admired by the public; second, and more important, the gold or silver masked the bitter flavor of many of the plant drugs of the late nineteenth century. The gold or silver passed through the body unchanged.

If a pharmacist wished to make a large quantity of pills, he would use the pill machine you see here. To use the machine, the pharmacist would make the pill pipes much as I have described, lay them in the bed of this machine, and form up to twenty-five pills at one stroke. Truly, a labor-saving device!



Fig. 5 Pharmacy student Linda Wright displays the contents of her mortar to curious young visitors to the Ohio Village Pharmacy during a scheduled demonstration period.

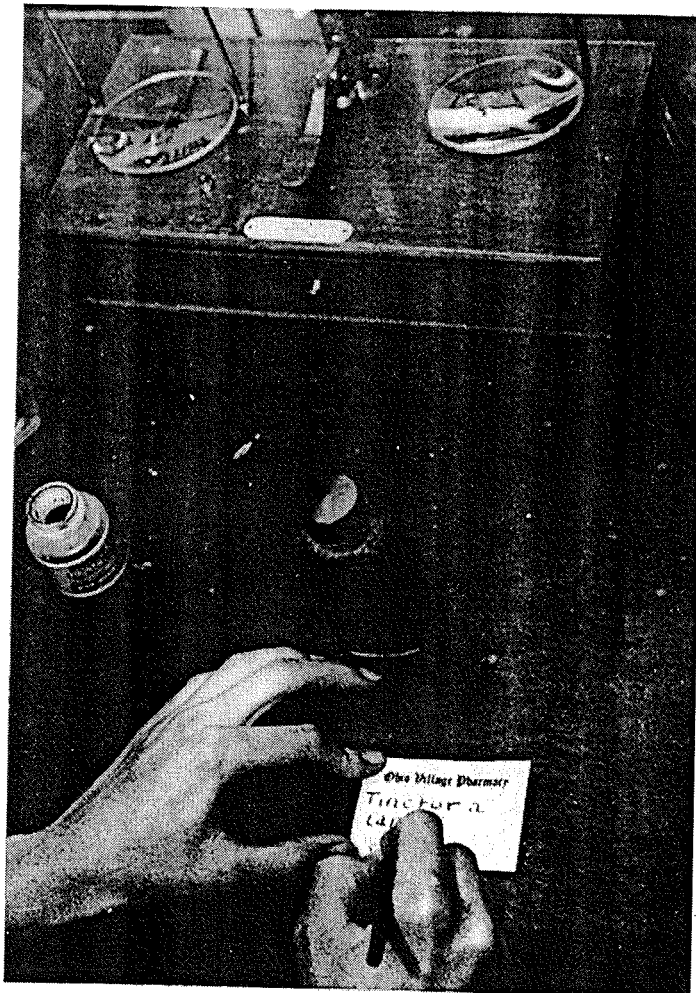


Fig. 6 Students print labels for their drug products using steel-nibbed ink pens. A mid-nineteenth-century pan balance used for weighing prescription ingredients is in the background.

nineteenth-century pharmaceutical preparation, or a topic of professional or scientific interest to American pharmacists during the period 1865-75. Figure 1 is an example of a student report on the preparation of aloe pills, a popular nineteenth-century laxative product. These reports can serve as the basis for the more informal interpretation scripts, which allow the students to demonstrate their compounding and dispensing skills, while explaining to visitors what they are doing—and why—in an organized, educational, and efficient manner. Figure 2 is an example of such an interpretation script, which stresses the pharmacist's role in combatting drug adulteration and providing some relief from the intestinal travail brought about by nineteenth-century dietary habits. Once the students feel comfortable with their interpretation, they can abandon their formal scripts and concentrate on tailoring their remarks to specific audiences, such as the groups of school children who can always be counted upon to ask unusual and challenging questions. Finally, students are encouraged to make a record of all questions asked by visitors during the course of their demonstrations and of their responses. These records serve not only as the basis for weekly recitations, but are also collected to create a resource manual for other interpreters. Students can elect to repeat the practicum up to three times, each offering being progressively more challenging, both with regard to the drug products they prepare and the professional and scientific concepts they discuss with the public. The practicum also provides students with an opportunity to practice the interpersonal communication skills they will need as licensed pharmacists in contemporary society. For this reason, in addition to experiencing and conveying some of the "feel" of practicing pharmacy in the nineteenth century, students participating in the practicum can receive up to 300 hours toward their 1,500-hour practical experience requirement for licensure with the Ohio State Board of Pharmacy.

The Ohio Village Pharmacy demonstration project is truly a cooperative venture. The Ohio Historical Society provides costumes and parking passes for the student volunteers and a modest budget to the College for the purchase of the drugs and chemicals used in both the demonstrations at the Village and instruction at the College of Pharmacy; in turn, the College provides special laboratory instruction for the Society's interpreters, compounds authentic mid-nineteenth-century pharmaceutical products, locates hard-to-find botanical drugs to display in the Pharmacy's

antique apothecary jars, and provides consultation in the history of pharmacy.

Since their inception in 1986, the courses have attracted over a dozen dedicated pharmacy students, a respectable amount of regional publicity,¹¹ and national recognition in the form of the coveted Certificate of Commendation conferred upon the author in 1987 by the American Institute of the History of Pharmacy.¹² In continuing their unique and mutually beneficial relationship, the Ohio Historical Society and The Ohio State University College of Pharmacy have not only underscored the societal role of the pharmacist as a pivotal member of the health-care team, but have also helped create a greater public appreciation for the place that the drug store has had in the life of American communities. The success of the program suggests that it could serve as a model for similar collaborative efforts between museums and institutions of higher learning to interpret the history of specialized professions for the public.

Notes

¹See George B. Griffenhagen and Ernst W. Steib, *Pharmacy Museums and Historical Collections in the United States and Canada* (Madison, Wis.: American Institute of the History of Pharmacy, 1988).

²The historic parks and villages of Canada are particularly rich in pharmacy restorations. These Canadian restorations include the 1908 Livingstone Pharmacy at Heritage Park Historical Village in Calgary and the 1885-era Daly's Drug Store of Fort Edmonton Park in Edmonton, both in Alberta; the gold rush era J.P. Taylor Drug Store in Barkerville Historic Park, Finlayson's Pharmacy and Way San Yuen Wat Kee and Company (a Chinese herbalist's shop) in Burnaby Village Museum representing the period before 1925, and the 1896 Pioneer Drug Store in Fort Steele Historic Park, all in British Columbia; in Nova Scotia, a reconstruction of the 1605 Habitation at Port Royal presents drug therapy available to the first permanent settlement in North American north of Florida, while the drug store in Sherbrooke Village captures late nineteenth-century pharmacy practice; Ontario's Sainte-Marie Among the Hurons in Midland includes a hospital pharmacy as part of its recreation of a Jesuit mission of the 1640s, and a 1900-era pharmacy graces the Georgina Village Museum in Sutton West; finally, the Western Development Museum and pioneer Village of North Battleford, Saskatchewan recreates a pharmacy shop of the early 1920s. See Griffenhagen and Steib 73-86.

³In the United States there are six museum villages in addition to Williamsburg that have restored pharmacies. In Connecticut, Mystic Seaport's Brinhurst Apothecary Shop (originally in Wilmington, Delaware) interprets the period from 1870-1885. The Druggist's Shop of the Farmer's Museum in Cooperstown, New York, is a recreation of a village physician's office built in 1832. Henry Ford's eclectic Greenfield Village in Dearborn, Michigan, provides the

setting for the 1835 Phoenixville (Connecticut) Post Office and Apothecary. The Vernon Drug Store, located in Museum Village, Monroe, New York, is a typical country drug store of the period from 1890 to 1920. A Prairie Drug Store is part of the Bonanzaville, U.S.A. Pioneer Village and Museum of West Fargo, North Dakota. The Utah Pioneer Village of Farmington, Utah, features a reconstruction of the 1893 pharmacy of G.P. Crabtree of Cairo, Illinois. See George B. Griffenhagen's series entitled "Early American Pharmacies" published in *Journal of the American Pharmaceutical Association*, Practical Pharmacy Ed. (hereafter cited as *JAPhA PPE*) 14 (1953): 732 and 15 (1954): 124, 172, 306. See also George E. Osborne, "At Mystic Seaport: Pharmacy History Recaptured," *JAPhA NS* 4 (1964): 538-40; Ernst W. Stieb, "The Past Recaptured: 16. The H. R. & W. Bringham Druggists and Chemists Pharmacy," *Pharmacy in History* 18 (1976): 76; "Come to Detroit," *JAPhA PPE* 2 (1941): 216-17; Griffenhagen and Stieb 45, 52, 65.

⁴Griffenhagen, "Early American Pharmacies: XXI. The Pasteur-Galt Apothecary Shop," *JAPhA PPE* (1954): 245. The interpretation by "apothecary" Norman Marshall is highlighted in Beverly M. Bowie's "Williamsburg: Its College and Its Cinderella City," *National Geographic* 106 (1954): 439-86.

⁵Ernst W. Stieb, "The Past Recaptured: 6. The Niagara Apothecary," *Pharmacy in History* 15 (1972): 42. Also see Peter John Stokes, "The Niagara Apothecary," *Bulletin of the Ontario College of Pharmacy* 20 (1971): 115-18; Stokes, "The Restoration of the Niagara Apothecary," *Bulletin of the Ontario College of Pharmacy* 17 (1968): 33-34; and Ernst W. Stieb, "Rough and Tumble Restoration," *Pharmacy in History* 14 (1972): 65-69.

⁶See Robert A. Buerki, "Dedication of the Ohio Village Pharmacy," *Pharmacy in History* 28 (1986): 161-62.

⁷Buerki, 162.

⁸Basic to the purpose of the course are the following: John Uri Lloyd, *Origin and History of All the Pharmacopoeial Vegetable Drugs, Chemicals and Preparations, with Bibliography* (Cincinnati: The Caxton Press, 1921), Vol. I, Vegetable Drugs; Friedrich A. Flückinger and Daniel Hanbury, *Pharmacographia, A History of the Principal Drugs of Vegetable Origin*, 2nd ed. (London: Macmillan and Co., 1879); *The Pharmacopoeia of the United States*, 5th Decennial Rev. (Philadelphia: J.B. Lippincott & Co., 1876); George M. Woods and Franklin Bache, *The Dispensary of the United States of America*, 14th ed. (Philadelphia: J.B. Lippincott and Co., 1876); Edward Parrish, *An Introduction to Practical Pharmacy*, 2nd ed. (Philadelphia: Blanchard and Lea, 1859); Francis Mohr and Theophilus Redwood, *Practical Pharmacy: The Arrangements, Apparatus, and Manipulations of the Pharmaceutical Shop and Laboratory*, ed. William Procter, Jr. (Philadelphia: Lea and Blanchard, 1849); and Edsel A. Ruddiman, *Incompatibilities in Prescriptions*, 2nd ed. (New York: John Wiley & Sons, 1900).

⁹See David L. Cowen, "Tying the Knot—*Secundem Artem*," *Pharmacy in History* 25 (1983): 145-46.

¹⁰The syllabus for Pharmacy 694.01, "History of Pharmacy II," includes the following assignments for the first week:

LECTURE: PHARMACY PRACTICE IN MID-NINETEENTH-CENTURY AMERICA.

Required Reading: John Uri Lloyd, "A Pharmaceutical Apprenticeship in America Fifty Years Ago," *Journal of the American Pharmaceutical Association*, 4 (1915), 1333-41.

"The Dispensing Counter," "The Dispensing of Medicines," and "Means for Preserving Cleanliness," in Francis Mohr and Theophilus Redwood, *Practical Pharmacy*, ed. William Procter, Jr. (Philadelphia: Lea and Blanchard, 1849), pp. 15-21 and 325-27.

Also See: "On the Furniture and Implements Necessary to the Dispensing Office or Shop," in Edward Parrish, *An Introduction to Practical Pharmacy*, 2nd ed. (Philadelphia: Blanchard and Lea, 1859), pp. 33-53.

LABORATORY: PHARMACY PRACTICE IN THE NINETEENTH CENTURY

Laboratory Reading: "On the Writing of Prescriptions," "The Dispensing of Liquids," and "Labeling," in Parrish, pp. 575-80 and 670-74.

Also See: "On Weights and Measures..." in Parrish, pp. 53-60.

Prepare: "Liquor Plumbi Subacetatis," *The Pharmacopoeia of the United States*, 5th Decennial Revision (Philadelphia: J.B. Lippincott and Co., 1876), hereafter referred to as "USP V," p. 218, reduced 1/16.

"Glycerin Paste," Parrish, p. 674, or

"Paste Preserved With Acetic Acid," Parrish, p. 674.

Practice labeling prescription bottles using steel-nibbed pens, ink, and a blotter; adhere to a prescription vial using the technique outlined in Parrish, p. 674; cork the vial, using a cork press (Parrish, p. 672).

A DETAILED SYLLABUS FOR THE ENTIRE COURSE CAN BE OBTAINED FROM THE AUTHOR AT THE OHIO STATE UNIVERSITY COLLEGE OF PHARMACY, 500 WEST TWELFTH AVENUE, COLUMBUS, OHIO 43210-1291.

¹¹Steve Benowitz, "19th-Century Pharmacy Methods Are Re-enacted," *OSU on Campus*, 26 June 1986: 6; Barbara Mellott, "Pharmacy Learned... the Old Way," (Mansfield, Ohio) *News Journal*, 5 August 1986: 1-C; Ruth Hanley, "Medicines of the Past," *Columbus (Ohio) Dispatch*, 26 August 1986: 4-C; and "Village Pharmacy Charms Visitors," (Ohio Historical Society) *Echoes* 25.11 (November 1986): 3.

¹²"Have You Heard? Historical Pharmaceutical Techniques," *Pharmacy in History* 30 (1988): 51.

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AN APPROACH TO TEACHING THE HISTORY OF PHARMACY

John L. Colaizzi

I believe that the professional education of pharmacists benefits substantially from the inclusion of the history of pharmacy as a formal part of the professional curriculum. Incorporating a few lectures that attempt to summarize the history of pharmacy within the framework of another professional practice course is better than nothing. However, my observations convince me that a specific course in the history of pharmacy, offered as a professional elective, is much more effective in developing a conscious appreciation of the importance and value of the history of pharmacy. Ideally, specialists and scholars in the history of pharmacy should take the lead in providing this instruction. Realistically, however, it is unlikely that most of our colleges are ready to commit a faculty position for this purpose. Who then will serve as teachers of the history of pharmacy? In many cases, a pharmacist-faculty member who has a serious interest in the history of pharmacy may be able to serve as an effective instructor for an introductory history of pharmacy course.

My predecessor, the late Dean Roy A. Bowers, and I are examples of such teachers of the history of pharmacy. Dean Bowers developed his interest in the history of pharmacy by his contact with Dean Kremers and Professor Urdang when he was an undergraduate and graduate student at the University of Wisconsin in the 1920s and 1930s. He was later influenced by his association and collaboration with another distinguished scholar in the history of pharmacy, Professor David L. Cowen, of Rutgers University. When Dean Bowers came to Rutgers in 1951, Professor Cowen taught a required course in the history of pharmacy. That course later became a professional elective.

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Upon the retirement of Professor Cowen, Dean Bowers began teaching the history of pharmacy elective. From the time of my appointment to the Rutgers faculty in 1978 to the time of his death in 1992, Dean Bowers offered the two-credit professional elective, and there was always a healthy demand for the course. My own interest in the history of pharmacy traces to when I was in the second year of the four-year B.S. program at the University of Pittsburgh School of Pharmacy. I took a required two-credit course in the history of pharmacy during the 1957-58 school year. It was taught by a faculty member from the Department of History in the College of Arts and Sciences. He began the course by telling us that he really didn't know anything about the history of pharmacy beyond what he had read in our textbook (the second edition of Kremers and Urdang), and that he had been assigned to teach this course more or less as a punishment because he was at a low rank and not in high favor within his departmental administration. That kind of approach would not likely occur today given the Continuous Quality Improvement (CQI) orientation in higher education. However, despite the professor's lack of enthusiasm, it became apparent as the course went on that he had a good grasp of world history which tended to make the course interesting. I nearly devoured the textbook. I still have my copy of it which shows it was well used with many passages underlined, and comments and extra notes inscribed in the margins. I really feel I learned a lot about the profession and its history from having studied that book during that course. We even wrote a term paper. Mine was on the topic of John Winthrop, the governor who cured the sick. Although I would not necessarily recommend that schools of pharmacy reinstate required courses in the history of pharmacy, that course which I took some 40 years ago ignited my interest in the history of pharmacy, and gave me better perspective for understanding and functioning within the profession of pharmacy. It remains a matter of conjecture whether I would have taken that course had it not been required.

My interest in the history of pharmacy persisted through the years as an amateur interest, so it was natural that I assumed the responsibility for teaching the course in 1992, and have continued to teach it since then.

The course is taught each academic term. The demand for the course has grown, and course enrollments have ranged from 30 to as many as 115 students. The students have been either at the third- or fourth-year level within the five- or six-year pharmacy programs. Students do not have a required textbook, but I provide them with a list of references that are available to them in the library, and which I use as a source of much of the information I discuss in class. Some of the key references are:

Glenn Sonnedeker, *Kremers and Urdang's History of Pharmacy*, 4th ed. Philadelphia: J. B. Lippincott Company, 1976.

David L. Cowen and William H. Helfand, *Pharmacy: An Illustrated History*. New York: Harry N. Abrams, Inc., 1990.

Lois N. Manger, *A History of Medicine*. New York: Marcel Dekker, Inc., 1992.

Erwin N. Ackerknecht, *A Short History of Medicine*. New York: The Ronald Press Co., 1955.

John Parascandola, *The Development of American Pharmacology*. Baltimore: The Johns Hopkins University Press, 1992.

Pharmacy in History (quarterly journal published by the American Institute of the History of Pharmacy).

Calvin H. Knowlton and Richard P. Penna, eds., *Pharmaceutical Care*. New York: Chapman and Hall, 1996.

Robert A. Buerki and Louis D. Vottero, *Ethical Responsibility in Pharmacy Practice*, rev. ed. Madison, Wisconsin: American Institute of the History of Pharmacy, 1996.

Miguel A. Faria, *Vandals at the Gates of Medicine*. Macon, Georgia: Hacienda Publishing, 1994.

Gregory J. Higby, *In Service to American Pharmacy: The Professional Life of William Procter, Jr.* Tuscaloosa, Alabama: The University of Alabama Press, 1992.

Other valuable resources that are used extensively in the course include slides of the Parke-Davis series in the history of pharmacy and the history of medicine, and the slide presentations that were recently made available through the AIHP ("The History of the Prescription Bottle," "The Evolution of the Drug Jar," "Carl Scheele," "Medicines in the American Revolutionary Period"). Among the resources that are available to us for this course, we are quite fortunate to have a number of distinguished historians of pharmacy and medicine to provide three to four guest lectures each time the course is offered. Professor Emeritus David L. Cowen provides one or two lectures on the history of pharmacotherapy. Visiting Professor John Parascandola provides a lecture on the history of chemotherapy; and the annual Cowen Lecture is incorporated as one of the required course lectures. The course includes 26 or 27 lectures and two or three exams, so about 15 percent of the lectures are given by professional historians of pharmacy, medicine, or health care.

A chronological approach is taken to the teaching of the course. Timelines are provided for each period or century, showing relevant names and events, with dates, prior to discussing the significance of the events in class. In choosing the topics and the areas for emphasis, a number of guiding principles, which reflect the philosophy of the course, are employed. These include:

- Trends, discoveries, advances, institutions, and diseases with as direct a relationship to pharmacy as possible are emphasized. The impact they have on the development of the practice and the science of pharmacy is stressed.
- Items which are more relevant to medicine than pharmacy are highlighted only if they are defining events of a period or have a significant importance in the development of pharmacy.
- Topics which emphasize the difficulty of truly separating pharmacy from medicine as an independent profession are emphasized.

- Trends which demonstrate pharmacy's positive impact on science, culture, economics, politics, and progress are pointed out.
- Illustrations of resistance to change and the futility of resisting change are noted.
- Every effort is made to point out how an understanding of the history of pharmacy helps the pharmacist to deal with current events in the profession, including the ability to interpret the current literature more intelligently.
- The unique and changing role of pharmacy as an integral part of the evolving health-care system, and the pharmacist's relationships with other participants within that system, are highlighted.

In pointing out the applications of a knowledge and appreciation of the history of pharmacy to the modern pharmacist, articles from the current professional or lay literature are frequently used as handouts or as homework assignments. The major sources of these pieces include all of the pharmacy publications of the major pharmacy associations as well as *Drug Topics*, *US Pharmacist*, *Pharmacy Times*, plus *NEJM*, *JAMA*, the *Wall Street Journal*, national news magazines and local newspapers. It is surprising how frequently relevant articles employ historical references, symbols, or allusions. Often these are given to the students not only as a reading assignment, but also as a written homework assignment. This approach has allowed us to continue to emphasize writing as an important skill, despite the fact that the popularity of the course has led to an increase in class size to the point where it is no longer feasible to assign a term paper to each student or to engage all students in significant classroom discussion. Written reports (homework assignments) make up about 20 percent of the student's grade; the remainder of the grade is based on the exams. The final exam is cumulative, but emphasizes the last part of the course. The exams all include some discussion questions, short-answer explanations, and a few objective questions (usually multiple choice). The exams do not emphasize memorization of facts, but rather emphasize the student's ability to access

information, synthesize and analyze information, and to apply concepts. For this reason, all exams are open-book with a strictly enforced time limit.

Formal student evaluation (mandatory at Rutgers University) of the course is conducted toward the end of each term. Course evaluations show that students generally like the course, finding it both enjoyable and useful to them as they prepare for roles in pharmacy. They sometimes comment that the course should be required and that it has given them a much better appreciation for the profession, and that they will recommend it to their peers. They also generally feel that the course content justifies three credits rather than just two.

TEACHING THE HISTORY OF PHARMACY: THE UNIVERSITY OF CINCINNATI EXAMPLE

Michael A. Flannery

Background

Despite my newness to the field of pharmaceutical history, I have been teaching graduate and undergraduate history courses on a regular basis for the past six years. I think some general college classroom experience is perhaps equally applicable to the teaching of pharmaceutical history in particular, and I shall try to suggest some of these applications as I proceed. Having said that, unlike many here who have been teaching a history course in pharmacy for some time and are justifiably concerned over the widespread decline of offerings elsewhere across the United States, I bring news of a more pleasant note: after a ten-year absence from the curriculum, the University of Cincinnati's College of Pharmacy plans to offer a two-hour elective to students in their first year of professional studies.

The history of pharmacy at the University of Cincinnati (UC) had its heyday under the impetus of Dr. Joseph F. Kowalewski, Dean of the College of Pharmacy from 1949 to his retirement in 1970. Specifically it began in the last two years of Dean Kowalewski's tenure when he brought Alex Berman from the University of Texas to teach a three-hour required course as Professor of Historical and Social Studies in Pharmacy in 1968. For the next six years students were exposed to a breadth of historical material taught by this Ph.D. from the University of Wisconsin, an educational experience made all the more expansive by his own pioneering research in the 19th-century botanico-medical

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movement in the United States and his seminal work in French pharmacy under a Guggenheim grant.

In 1974 Berman retired and the history course was taken over by Dr. Raymond Watson. The snapshot we have of the history of pharmacy course from Robert Buerki's ambitious study, *Survey of Instructional Resources in History of Pharmacy Undergraduate Courses* (1981), is taken from the Watson years. We see here that the course was required, had 70 students enrolled, and was offered for two credits. The course remained part of the curriculum until Watson's retirement in 1987 whereupon history gave way to more clinical, science-based offerings.

This brief description of the history of pharmacy at UC pretty much sums up the status of the course up through 1996. But in that year something interesting happened: I was invited to speak at a class taught by James B. LaValle, an adjunct instructor who was teaching "A Survey of Natural Medicine" elective at the College. Being a course devoted to phytomedicine and phyto-pharmaceuticals, I emphasized the important role played by vegetable products in the history of pharmacy. More specifically, I discussed the rich repository offered in the 200,000-volume collection at the Lloyd Library. Many of these students had never heard of the Library until I addressed them that day. A few days later some students (seniors, I believe) came to the Library and suggested that I seriously pursue offering a course in the history of pharmacy, a course they felt certain would be well received by their fellow students.

What ensued was an initial contact with the chair of the curriculum committee, Dr. Robert J. Cluxton. I suggested a lunch meeting between myself and Alex Berman, whom I knew was still very much interested in the history of pharmacy and quite interested in getting a course on the subject reintroduced at UC. It turns out that Cluxton had been a former student of Berman's who was delighted by the prospect of renewing his acquaintance with his former teacher. This meeting set into

motion the preliminary steps necessary to implement an elective course, the essence of which is embodied in a prospectus submitted and approved by the College of Pharmacy Curriculum Committee in February of 1997 (see Appendix A).

The Course Methodology and Design

Given the fact that I was starting from a blank slate, a survey course was obligatory. But here the question of focus enters in. Should I cover the vast expanse of pharmaceutical history marching from ancient times to present? Having taught other history courses and fairly cognizant of the tolerance levels of most undergraduates, I frankly wondered how attentive students might be as I plodded through the *Papyrus Ebers*, introduced them to Maimonides, or explained the iatrochemistry of the Paracelsians. These are all important topics, but at the introductory level I want above all to engage student's interest in and appreciation of the history of their future profession in a more immediate sort of way. I want to spark their curiosity to know more and above all to enliven some *sustained* interest in their pharmaceutical heritage--all this in just ten weeks! I therefore opted to emphasize those things with which students could most readily identify--pharmacy in an American context.

Some would criticize this approach. George Urdang, for example, felt that it was impossible to understand American pharmaceutical development without first acquiring a knowledge of what he called, "pharmacy in the Great European countries." Indeed for Urdang, "These United States have been settled by Europeans of a rather high and stabilized culture which they tried to transfer to this, in every respect, New World." Perhaps, but historiographical advances since Urdang's writing paint a much more complex picture of American development. If America's more formal institutions

have been largely shaped by European antecedents, it cannot be forgotten that society in the United States has also been mightily influenced by non-European factors. Consider, for example, the tremendous impact that indigenous cultures had upon the developing American materia medica; the interplay and influence of African-American folk remedies upon Southern therapeutics; the unique impact of Jacksonian democracy in the emergence of a botanico-medical movement in antebellum America; the rapid growth of proprietary medicines in this country; and the unique development of official pharmaceutical literature in what had been recently referred to as "a spirit of voluntarism." These special features of American pharmaceutical development can easily be overdrawn; indeed I do not for a moment suggest that a course on the history of pharmacy can be taught successfully without some reference to Europe's foundational contributions to the field. Yet history departments all across America teach two basic survey courses that are usually part of the required core curriculum: a Western Civilization course, normally divided into at least two parts, and a companion American history course, also normally divided into at least two parts. In many (if not most) of these programs the two are essentially mutually exclusive; students taking "Western Civ." need not take "American History" to satisfy their history requirements and vice versa. Despite whatever inherent weaknesses there may be in such a widely adopted system, there is to my knowledge no reason why the same system may not be applied to the example of pharmacy. I see no reason why they must have the kind of grounding suggested by Urdang. At best, the introduction of ancient, medieval, and other European topics will provide the backdrop for a deeper understanding of technical and professional developments in the emerging modern era; at worst, it will become a somnambulist exercise that students quickly forget, confirming their preconceived notions that history is a dusty, dismal affair with little relevance to daily life.

Present Status and Some Constructive Lessons

Thanks to the efforts of Dr. Daniel Acosta, newly installed Dean of the College, adjunct appointment has been approved and the course is planned for the fall quarter. The initiation of this process involved Alex Berman as well. Dan Acosta (another former Berman student) and I met shortly after the Dean's arrival at UC. Having introduced the Dean to the vast holdings available for historical studies in pharmacy at the Lloyd Library and having outlined my course proposal, his response to a history of pharmacy course was immediate and actively supportive. Dean Acosta has moved the course proposal through the appropriate channels with great speed for a large university. Decanal and administrative support is crucial to the course implementation process. My experience would also suggest that students, when properly introduced to the history of their field, will become the historian's greatest ally in promoting a course of instruction since the initial suggestion for a course really came from them. Finally, there is yet another valuable lesson: The continued interest in and devotion to the history of pharmacy by veterans in the field needs to be exploited. Emeritus professors like Berman can serve as the vital links with existing teaching and administrative faculty to rekindle not only fond memories but also an active interest in introducing history courses to a new generation of students.

Human and Material Resources

Given administrative commitment, student interest, and emeritus support, who should teach such a course? The nature of the course being taught suggests that first and foremost the candidate should have some knowledge of historical methodology. This entails an understanding of and appreciation for primary source material as well as a thorough grounding in the secondary sources

of pharmaceutical history. He or she *need not be a pharmacist* to fulfill this requirement. Those who question this should ask themselves if military history must be taught by a general, if medical history must be taught by an M.D., if diplomatic history must be taught by a diplomat, or if political history must be taught by a politician. The answer, of course, in each case is no and it seldom is. What is needed is not pharmaceutical expertise *per se* but rather an ability to interpret and synthesize those factors which have impacted and appreciably influenced pharmacy through the ages--these are two quite distinct skills. This realization contains an important caveat: the history of pharmacy *cannot* and should not be taught just any willing subject. What the eminent historian George Sarton has said of teaching the history of science is surely true of teaching the history of pharmacy: beware of "help" from "ignorant and dangerous friends" who are scientists first and historians last. In the words of the great French historian Marc Bloch, "the elves of antiquarianism have cut capers about the cradle of more than one serious study." In closing on the question of human resources in the history of pharmacy, I will simply say that the issue of teaching this subject is a matter of perspective and appropriate skill, not necessarily one of academic degrees. While the current field suffers from a serious paucity of trained Ph.D.s, this does not mean that competent expertise is lacking. A good historian may be suggested by his or her credentials, but it is *always* discernible in his or her lectures, published work, and academic writing, and the candidate should be judged on that basis. I'm always mindful that two of the finest historians I've had the pleasure to read, Barbara Tuchman and Bruce Catton, were essentially uncredentialed and self-taught. Yet as writers with the ability to bring the past to life they are unexcelled, and this is what is needed in the classroom.

In terms of material resources, the proximity of this collection to UC students and faculty (about a ten-minute drive) gives them access to primary and secondary historical resources equaled

in only a few of the most prestigious institutions throughout the world. Nevertheless, I agree with a comment made by Alex Berman in the *American Journal of Pharmaceutical Education* back in 1969 "that every college of pharmacy library can acquire a ready reference of secondary historical literature in English suitable for the use of students and teachers." Costs notwithstanding, it is in some ways easier to acquire and keep pace with the literature of the field than it was when Berman penned these words nearly thirty years ago. A checklist of titles in key areas is now available in Gregory J. Higby and Elaine C. Stroud's *The History of Pharmacy: A Selected Annotated Bibliography* (1995) which include some 1,255 citations in the field. For those interested in acquiring an "instant" core collection of primary resources in the history of American pharmacy one is available through University Microfilms International as outlined in Nydia King's *A Selection of Primary Sources For the History of Pharmacy in the United States* (1987). Those contemplating proposing a course should first work with the university librarian in identifying existing strengths and weaknesses in the collection; the question of support material will undoubtedly come up in the course proposal process. Once the course is approved, it should be requested that the librarian revise the existing profile with their book vendor(s) to include history of pharmacy titles. Virtually every academic library today selects most of its books from vendor profile slips. These are order forms generated by book suppliers such as Baker & Taylor or Blackwell North America that are in the business of keeping pace with titles as they become available from hundreds of presses foreign and domestic. By expanding the university's book vendor profile to include history of pharmacy publications, book selectors are guaranteed of being alerted to virtually every new book and journal in the history of pharmacy.

Conclusion

Despite the many challenges ahead, there is much to recommend the teaching of pharmaceutical history. George Urdang demonstrated years ago that pharmacy is an integral part of the social, economic, political, and cultural life of the larger community in which it resides. As such, pharmacy cannot be practiced effectively as a science divorced from the society of which it is a part nor can it be seen simply as a profession which manifests itself as a series of ever-changing contemporary issues. All of these myopic visions fail to see that in its fullest sense pharmacy is a science interacting with society to produce contemporary issues all with historical roots. As such, I know of no better way to prepare students to meet the challenges of the future than by a firm grounding in the past.*

*Since this symposium, this course was delivered in the 1997 and 1998 academic years. Since 1999, the course has been given by Dennis B. Worthen, new Executive Director of the Lloyd Library.

Appendix A

A Prospectus for a Course in the History of Pharmacy

Title: History of Pharmacy in America

Course objective: The objective of this course is to introduce the pharmacy student to the history of the discipline. This will be accomplished by focusing upon the historical development of pharmacy in the United States through an examination of the growth and professionalization of the field, its commercial and industrial growth, its statutory regulation, and its product development as demonstrated in its changing materia medica, dosage forms, and methods of standardization.

When completed the student should understand and be familiar with the general historical development of American pharmacy, its literature, and its reference tools for historical inquiry. Moreover, the student should see clearly that pharmacy does not exist apart from the larger context of sociopolitical, socioeconomic, or sociocultural development in which it resides. The course of pharmaceutical development has been and indeed will always be informed and determined by these larger factors; these are best understood and interpreted through systematic historical analysis.

Textbook: Kremers and Urdang's History of Pharmacy, 4th ed., revised by Glenn Sonnedeker. 1976; Madison, WI: AIHP, 1986.

Readings: The readings listed by each week are to be considered required, not supplemental to the course. They will be placed on reserve at the College of Pharmacy library. While the reading list looks formidable, no single week's assigned readings exceed 100 pages.

Student evaluation: Students will be evaluated on the basis of a midterm exam; a final exam; and an 8 to 10 page "historical problem paper." Each grade will count for one-third of the final grade for the course.

Problem paper in the history of pharmacy: Each student will be given a handout enumerating five historical issues or problems in pharmacy. Of those problems, the student will choose one as his/her topic and will write an essay addressing that question.

The paper should be typed, double-spaced, and of 8 to 10 pages in length. The paper should demonstrate evidence of independent study beyond the material provided in the text and/or directed readings. All sources must be documented and cited according to proper style (MLA Style Manual or Chicago Manual of Style).

Course Outline

Week #1

Lecture, pt. 1: What Do We Mean by "The History of Pharmacy" and Why Should We Study IT?

Readings: Alex Berman, "Writing in the History of Pharmacy: Sources of Material," *American Journal of Pharmaceutical Education* 33 (December, 1969): 843-49; David A. Febo, "Liberal Arts and Pharmacy Education," *Pharmacy in History* 22:2 (1980): 60-68; John M. Riddle, "Everybody, the Historian, and the Scientist," *Pharmacy in History* 37:4 (1995): 159-64.

Lecture, pt. 2: A Thumbnail Sketch of the History of Medicine as It Relates to Pharmacy

Readings: James Burke, "What the Doctor Ordered," in *The Day the Universe Changed*, rev. ed. (Boston: Little, Brown, 1995), pp. 195-237; David L. Cowen, "Pharmacists and Physicians: An Uneasy Relationship," *Pharmacy in History* 34:1 (1992): 3-16.

Week #2

Lecture: The Colonial Period, 1492-1775

Readings: *History of Pharmacy*, chap. 9; J. Worth Estes, "The European Reception of the First Drugs from the New World," *Pharmacy in History* 37:1 (1995): 3-23.

Lecture: The Revolutionary Period, 1775-1783

This lecture will include a presentation of 45 slides compiled by Michael B. Shannon on "Medicines in the American Revolutionary Period."

Readings: *History of Pharmacy*, chap. 10; David L. Cowen, *The Colonial and Revolutionary Heritage of Pharmacy in America*. Madison, WI: AIHP, 1976. 24 pp.

Week #4

Lecture: The Early Republic, 1783-1860

Readings: *History of Pharmacy*, chap. 11; Alex Berman, "The Heroic Approach In 19th Century Therapeutics," *Bulletin of the American Society of Hospital Pharmacists* (Sept./Oct. 1954): 321-27; Berman, "The Botanic Practitioners of 19th-Century America," *American Professional Pharmacist* (October 1957): 866-70, 911-12.

Week #5

Midterm Exam

Lecture: American Pharmacy Matures: A Look at State and National Associations, APhA, NARD, ASHP, etc, and Other Factors Leading Toward a Professionalized Field.

Readings: *History of Pharmacy*, chap. 12; Gregory J. Higby, "Professionalism and the Nineteenth-Century American Pharmacist," *Pharmacy in History* 28:3 (1986): 115-24; David L. Cowen and William H. Helfand,

"The Progressive Movement and Its Impact on Pharmacy," *Pharmaceutica Acta Helvetica* 54 (1979): 317-23.

Week #6

Lecture: Statutory Regulation

Readings: *History of Pharmacy*, chap. 13; Glenn Sonnedecker, "Drug Standards Become Official," in *The Early Years of Federal Food and Drug Control* (Madison, WI: AIHP, 1982), pp. 28-39; John P. Swann, "FDA and the Practice of Pharmacy: Prescription Drug Regulation Before the Durham-Humphrey Amendment of 1951," *Pharmacy in History* 36:2 (1994): 55-70; David L. Cowen, "The Development of State Pharmaceutical Law," *Pharmacy in History* 37:2 (1995): 47-58.

Week #7

Lecture: Pharmacy Education in the U.S.

Readings: *History of Pharmacy*, chap. 14; Henri R. Manassee, Jr., "Albert B. Prescott's Legacy to Pharmaceutical Education in America," *Pharmacy in History* 15:1 (1973): 22-28; George Urdang, "Edward Kremers (1865-1941): Reformer of American Pharmaceutical Education," *Transactions of the Wisconsin Academy of Sciences, Arts, and Letters* 37 (1945): 111-35; John Parascandola and John Swann, "Development of Pharmacology in American Schools of Pharmacy," *Pharmacy in History* 25:3 (1983): 95-115.

Week #8

Lecture: Pharmaceutical Literature in the U.S.

Readings: *History of Pharmacy*, chap. 15; Glenn Sonnedecker, "The Beginning of American Pharmaceutical Journalism," *Pharmacy in History* 33:2 (1991): 63-69; Gregory J. Higby, "Publication of the National Formulary: A Turning Point for American Pharmacy," in *One Hundred Years of the National Formulary* (Madison, WI: AIHP, 1989), pp. 3-19.

Lecture: The Economics of American Pharmacy

Readings: *History of Pharmacy*, chap. 16; Norman Gevitz, "Domestic Medical Guides and the Drug Trade in Nineteenth-Century America," *Pharmacy in History* 32:2 (1990): 51-56; John P. Swann, "The Evolution of the American Pharmaceutical Industry," *Pharmacy in History* 37:2 (1995): 76-86; Jonathon Liebenau, "Scientific Ambitions: The Pharmaceutical Industry," *Pharmacy in History* 27:1 (1985): 3-11; John Parascandola, "Industrial Research Comes of Age: The American Pharmaceutical Industry, 1920-1940," *Pharmacy in History* 27:1 (1985): 12-21.

Week #10

Final Exam

Appendix B

Historical Issues in Pharmacy

Choose any one of the following and write an 8 to 10 page fully documented paper that covers the topic as thoroughly as this length allows.

1. Name three titles in American pharmaceutical literature that you consider of paramount historical significance. Briefly discuss the development of each, and explain precisely why you have chosen those titles. In your answer be sure to outline the significance of these titles as tools and guides for the practicing pharmacist, including the changing or static nature of each.
2. In early America so-called "office pharmacy" was commonplace. Today this is an unheard-of practice. What exactly is "office pharmacy" and what happened to it? How has this change affected pharmacy as a profession?
3. Define a patent medicine in both its technical and popular senses. Discuss the distinction between patent and proprietary medicines, and give a couple of nineteenth and early twentieth century examples. Can you characterize the pharmacology of these products? What impact did patent medicines have on the practice of pharmacy in the U.S.?
4. In 1870 there were 34 women to 17,335 men listed in the U.S. Census as "traders and dealers in drugs and medicines." In 1991 there were 48,900 women practitioners to 114,700 men, and by 2020 the ratio of women to men in practice is predicted to be 1:1. Explain this equalization in gender and discuss the development and role of women in professional pharmacy in the U.S.
5. George Urdang, a leader in historical studies in pharmacy, wrote, "The special inspirational value of biographies lies in the fact that the men concerned serve as models and as examples for the possibilities given in and by pharmacy." Even further, Thomas Carlyle once declared that "History is the essence of individual biographies." The point is that good historical biography delineates not only the individual under study but the context of that person within the larger social and professional life of the period. Bearing this in mind, write a biographical sketch of any one of the following individuals: John Bartram (1699-1777); Andrew Craigie (1754-1819); Lyman Spalding (1775-1821); Constantine S. Rafinesque (1783-1840); William Procter, Jr. (1817-1874); Edward R. Squibb (1819-1900); John M. Maisch (1831-1893); Frederick Stearns (1832-1907); Eli Lilly (1838-1898); Albert Ebert (1840-1906); Charles Rice (1841-1901); Joseph P. Remington (1847-1918); John Uri Lloyd (1849-1936); F. B. Power (1853-1927); James H. Beal (1861-1945); Edward Kremers (1865-1941); Rufus A. Lyman (1875-1957); Robert P. Fischelis (1891-1981).
6. In 1994 Congress passed the Dietary Supplement Health and Education Act (often referred to as the DSHEA Act). In broad outline, the emphasis of this legislation is actually more deregulatory than regulatory. Briefly outline the DSHEA Act. Please explain by comparing and contrasting any historical parallels to the deregulation of health care practice in this country, thus placing the DSHEA Act in historical context.
7. Higby and Anderson have characterized the development of the USP as exemplifying the "spirit of voluntarism." What do they mean by this, and do you think the historical evidence supports their assessment? Explain.
8. In a recent issue of the JAPhA, Varro E. Tyler of Purdue University noted the tremendous consumer interest in OTC herb products and called upon pharmacists to "do some homework to bring themselves up to speed as competent advisors." With U.S. sales of OTC herbals currently estimated at \$1.5 billion, Tyler's suggestion seems well founded, and yet the fact is that some of the most complete information on these natural products remains in the historical literature. With this in mind, take one of the following plants and summarize its history, its traditional medicinal uses, and its present use: feverfew, valerian, coneflower (both varieties), goldenseal, peppermint, garlic, ginkgo, milk thistle, rhubarb, ginseng (all varieties), scullcap, hawthorn, foxglove, belladonna, Jesuits' or Peruvian bark, black cohosh, ephedra, ginger, barberry, licorice, gentian, saw palmetto. Be sure to give the full scientific name, its past and present USP status, and its active chemical constituents.

TEACHING THE HISTORY OF PHARMACY TODAY

Eric J. Mack

It should be clearly stated that I am not an historian. Pharmacy has been an integral part of my whole life. I was raised in a family pharmacy in Portland, Maine. While growing up I became interested in the history of pharmacy; this interest carries through to this day. I was raised on a “diet” of old prescription recipe books, Parke-Davis paintings of pharmacy history, pharmacist guides, *USPs*, *NFs*, old prescription bottles, and weights. At the age of four, I decided to become a pharmacist some day. My fourth-grade science fair project involved pharmacy and I ground and mixed powders, filled capsules, and mixed colored solutions for the onlookers.

I attended the University of Rhode Island as an undergraduate. While I did not take the formal course in the history of pharmacy offered by the distinguished George Edwin Osborne III, he laid the groundwork for my efforts in promoting the history of pharmacy to students. Dr. Osborne was a proponent of providing historical background to his lectures in calculations, dosage forms, and physical pharmacy. I attended graduate school at the University of Utah where one of my mentors in pharmaceutics was Robert V. Petersen. One term I was his teaching assistant for the elective course in history of pharmacy that he taught annually.

I have a second admission to make. I have never taught a formal course in the history of pharmacy. I became an AIHP member in 1985. My faculty workload from 1985 to 1992 never permitted teaching an elective. I was fortunate that Northeastern University has an honors program.

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an adjunct to the pharmaceutical calculations course that I taught for students in their sophomore year (second preprofessional year). I decided to follow up on my interests and teach the adjunct as history of pharmacy. My first thought was to call Dr. Gregory Higby at AIHP and ask for help. Was there a tried and true, patented class outline with notes that I could adapt to my work, I asked, looking for the easy way out? Alas, Dr. Higby informed me, there was no such thing, but he and the Institute would help any way they could.

Attached as an appendix is the handout I created for the meeting. It details the efforts expended in the honors adjunct for the last four fall terms. It also includes a timeline I created to help put pharmacy history in perspective for the students. I fashioned the timeline using the history of pharmacy text and information about pharmacy in Boston and at Northeastern University gleaned from local sources. As an honors course adjunct, students were required to enhance their written and spoken communications skills. The first year I chose to use AIHP resources. I took all of the available books and pamphlets given to members and assigned one to each group of three students. On a weekly basis I lectured on a topic from the text. In addition, after considerable work outside of class, each group did a formal group presentation related to the AIHP book or pamphlet assigned to their group. At the end of the term, individual papers were collected on their specific topic. These were shared with my colleague, Dr. Michael Montagne, who reviewed them with an associate, critiqued them and ranked them. The "winning paper" was used as the basis that year for the winner of the AIHP Certificate for history of pharmacy awarded annually at Northeastern University (it usually goes to the Rho Chi historian).

The following year I chose to be different and used the text more. I took the chapters on pharmacy in America and assigned them to groups of two students (fewer honors students that year).

The admirable goal was to have each student group provide information to fill in the gap between the text's 1976 publication date and the present. Depending on the effort expended by the students the results were mixed and rather lukewarm. Prior to each group presentation, I lectured about the historical perspective for the topic area to be presented. Following the group presentation I directed a discussion of the subject presented, trying to play off of the presentation and any relevant issues.

The third year I let the students take a more active role in choosing their subject, forming their groups and creating their presentations. Group dynamics can be very interesting, but the resulting presentations were lukewarm again. Alas, I decided, college sophomores with little to no practical pharmacy experience lack true perspective of their chosen profession. Discussions with Dr. Higby led to an experiment in ethics in pharmacy guided by the AIHP publication, *Ethical Responsibility in Pharmacy Practice*. I assigned the text to the honors students and asked them to choose one of the many case studies in ethics provided in the text. This gave the students great latitude in the type of case chosen. Students could work alone or in groups. I asked the students to review a case and provide a brief summary of the issues, their chosen resolution and the groundwork for the dissenting opinion. These case reports were collected, blinded, and sent to each individual for critique. Individual students provided critiques of the presented opinions. The critiques were collected, collated, and sent back to the student groups for review. Each group, mindful of the critiques, rewrote and submitted a final case report for my review. I was pleased with the structure and student enthusiasm. Again, the naiveté displayed by college sophomores can be humorous at times. That, however, at present, is the level at which I have honors students.

For a few years I gave a lecture on the history of pharmacy (utilizing the timeline) in the freshmen pharmacy orientation course. It was more difficult to interest 100 students in a two-hour

lecture than to work annually with 10-18 sophomores on group projects and presentations. The adjunct is only one hour class time per week; it did not permit such things as field trips to the Ether Dome at Massachusetts General Hospital. The class has provided some interesting moments and has fulfilled a long-standing interest.

Appendix A

FROM THE COLLEGES**

NORTHEASTERN UNIVERSITY

Eric J. Mack, Ph.D., R.Ph., Assistant Professor of Pharmaceutics
tel: 617-373-3207, e-mail: emack@neu.edu

SPRING at Northeastern University means change with the end of the Winter Term and the beginning of the Spring Term. It also means the American Pharmaceutical Association (APhA) Annual Meeting, March 7 - 11, is at hand. BARD members Robert Blaser, Todd Brown, Mark Yorra and myself will be shepherding a number of pharmacy students to the meeting. This group includes Sophie Lanjuin, a fifth-year (first-year Pharm.D.) student, who won this winter's patient counseling competition sponsored by the program's APhA-ASP and Rho Chi chapters. If you are a BARD member, especially a Northeastern University alumnus, attending the meeting, be sure to stop by the NU table at the exposition on Sunday and say hello. The students will have NU Pharmacy t-shirts and hats for sale. Todd Brown will have a poster presentation. Posters usually hang in the Exposition Hall for 24 hours. I am an invited speaker. I am part of a panel discussion cosponsored by the American Institute of the History of Pharmacy (AIHP) regarding academic styles and approaches to teaching the history of pharmacy. The presentation is first thing Tuesday morning, in direct conflict with the different colleges' breakfasts. If you are interested, come on by. As an invited speaker, I will even have a brief biography posted in the program.

If you are interested in the history of pharmacy or pharmacy sociology or pharmacy ethics, you might be interested in AIHP. The association has a quarterly journal with articles of both academic and personal interest as well as a regular newsletter with a collectors corner for individuals to present pharmacy-related items for sale or interest to buy items. For more information, contact me or contact AIHP at 608-262-5378.

The Pharmacy Program was recently reaccredited by the American Council on Pharmaceutical Education (ACPE, the people who also accredit continuing education programs). Reaccreditation for the Pharmacy Program has come at the time at which we are actively working towards the implementation of the entry-level Doctor of Pharmacy degree. The Fall 1997 entering freshman class (graduating Class of 2003) will be the first entry-level six-year program. Course work for this new curriculum includes integration of clinical pharmacology and therapeutics earlier in the student's academic career and expanded clinical experiences. Northeastern University currently has a track-in Pharm.D. degree; students complete four years of the current B.S. program and apply before March 1 of the fourth year for entry into two years of expanded course work leading to the Pharm.D. degree. This June will mark graduation for the second track-in Pharm.D. class; junior students are currently vying for spots in the new September class.

Work continues on our plans for implementing the Nontraditional Pharm.D. degree and Disease State Management Workshops. We hope that graduates of these programs will serve as clinical preceptors for all of our Pharm.D. programs in the future. In the future, we expect to provide clinical experiences in all aspects of pharmacy. As most of you know, it is my fervent wish to create superior clinical experiences within community pharmacy practice. Feel free to contact me if you would like to discuss these issues, find out more information or become a preceptor.

** *Boston Association of Retail Druggists Newsletter* (March, 1997).

Appendix B

NORTHEASTERN UNIVERSITY Bouvé College of Pharmacy & Health Sciences

PCT 1777 Sophomore Pharmaceutics Honors
(in conjunction with PCT 1240)

History of Pharmacy

Dr. Eric J. Mack, instructor

Course Description

The honors adjunct was taught fall quarter 1993 by Dr. Eric J. Mack of the Department of Pharmaceutical Sciences. The history of pharmacy is an area that receives little or no attention in the pharmacy curriculum, but is thought to be of great importance in recognizing and understanding the professionalism required of a pharmacist. To meet the perceived objectives and skills required by an honors course, the students were provided lectures on background and skill development and prepared topical group presentations and individual term papers (see enclosed course outline). The initial lecture was an overview of the history of pharmacy with emphasis on pharmacy in this hemisphere. For the second lecture, the students were given an interactive lecture by Marilyn Steinberg of the library staff. They were shown how to research appropriate reference material using the university's computer system. A lecture on writing techniques and skills was given by a member of the English Department/Writing Center. A lecture on presentation skills and techniques was provided by Dr. Mack.

At the beginning of the term, the students selected groups to work with and randomly chose project (presentation and term papers) areas. Each project group was presented with reference materials as available (a general text and reference works were obtained from the American Institute of the History of Pharmacy, Madison, Wisconsin, and distributed to the appropriate group). Dr. Mack worked with each group on a weekly (and on an as needed) basis to shape presentations, maintain project focus, and develop additional reference materials for term papers.

For the final five weeks of the quarter, each class began with a 30-minute presentation by a given group in their topic area (approximately 10 minutes presentation time for each student). This was followed by a review of the topic area by Dr. Mack for its relevance and important concepts as well as providing additional information not given during the presentation. Dr. Mack also moderated a class discussion of the presentation topic and directed questions from the class to the appropriate presenter. The balance of the class time was spent working with groups yet to give presentations or in discussion of individual term papers.

Term papers were collected December 6. These have been reviewed by the instructor. Grading on a satisfactory/unsatisfactory basis (chosen by the students) was achieved with the successful completion of a group presentation and an individual term paper. The term papers will be shared with local pharmacy historians. A single paper will be chosen as best paper by this "panel." The "winner" will receive a certificate at the Pharmacy Program's Spring Awards Luncheon in April.

NORTHEASTERN UNIVERSITY
Bouvé College of Pharmacy & Health Sciences

PCT 1777 Sophomore Pharmaceutics; Honors
(in conjunction with PCT 1240)

History of Pharmacy

Course Outline

Class meets Mondays 9:15 - 10:20 AM in Room 411 Ell Building

October 4	Introduction - History of Pharmacy Overview
October 11	Columbus Day Holiday
October 18	Library research
October 25	How to write a paper
November 1	How to make a presentation
November 8	GROUP I PRESENTATION Hicks-Duggan, Gilson, Qaqish <i>Folklore and Folk Medicines</i>
November 15	GROUP II PRESENTATION Campochiaro, Graime, Smotrycz <i>Pharmacy - Colonial and Revolutionary Periods</i>
November 22	GROUP III PRESENTATION Ashcraft, Bongiorno, Dodds <i>History of Pharmaceutical Manufacturers</i>
November 29	GROUP IV PRESENTATION Ahmed, Casella, Duncan <i>History of Antibiotics</i>
December 6	Profession of pharmacy (Chapter 16) GROUP V PRESENTATION O'Connell, Psiakis <i>History of Substance Abuse</i> Papers (5-10 pages) due by 1:30 PM

Appendix C

NORTHEASTERN UNIVERSITY Bouvé College of Pharmacy & Health Sciences

Fall 1994

PCT 1777 Sophomore Pharmaceutics Honors
(in conjunction with PCT 1240)

History of Pharmacy

Dr. Eric J. Mack, instructor

Course Description

The honors adjunct was taught fall quarter 1994 by Dr. Eric J. Mack of the Department of Pharmaceutical Sciences. To meet the perceived objectives and skills required by an honors course, the students were provided lectures on background and skill development and prepared topical group presentations and individual term papers. The initial lecture was an overview of the history of pharmacy with emphasis on pharmacy in this hemisphere. For the second lecture, the students were given an interactive lecture by Marilyn Steinberg of the library staff. They were shown how to research appropriate reference material using the university's computer resources. The first part of the final background/skills lecture was provided by a member of the University's Writing Center regarding writing techniques, skills, and appropriate referencing for research papers. The balance of the lecture was provided by Dr. Mack on presentation skills and techniques.

At the beginning of the term the students were grouped into pairs and randomly chose project (presentation and term papers) areas and presentation dates. A general text was obtained from the American Institute of the History of Pharmacy, Madison, Wisconsin, and distributed to the students. Dr. Mack worked with each group on a weekly (and on an as needed) basis to shape presentations, maintain project focus and develop additional reference materials for term papers.

For the final six weeks of the course, each class began with a 20-minute presentation by a given group in their topic area (approximately 10 minutes presentation time for each student). This was followed by a review of the topic area by Dr. Mack for its relevance and important concepts as well as providing additional information not given during the presentation. Dr. Mack also moderated a class discussion of the presentation topic and related areas in pharmacy.

Term papers were collected November 30. These have been reviewed by the instructor. Grading on a satisfactory/unsatisfactory basis (chosen by the students) was achieved with the successful completion of a group presentation and an individual term paper. The term papers were shared with a local pharmacy historian.

Appendix D

NORTHEASTERN UNIVERSITY Bouvé College of Pharmacy & Health Sciences

Fall 1995

PCT 1777 Sophomore Pharmaceutics Honors
(in conjunction with PCT 1240)

History of Pharmacy

Dr. Eric J. Mack, instructor

Course Description

The honors adjunct for fall quarter 1995 was taught by Dr. Eric J. Mack of the Department of Pharmaceutical Sciences. The history of pharmacy is an area that receives little or no attention in the pharmacy curriculum, but is thought to be of great importance in recognizing and understanding the professionalism required of a pharmacist. To meet the perceived objectives and skills required by an honors course, the student was involved in classroom discussions on background and skill development moderated by the instructor and prepared topical group presentations and individual term papers. At the time of registration for the course, students were provided with a preliminary copy of this course description. Students without computer searching/literacy skills were shown how to research appropriate material using the University's computer system, World Wide Web, and MedLine. Writing techniques/skills and presentation skills/techniques were discussed by Dr. Mack.

At the beginning of the term the students divided themselves into four groups (emphasis on team work) based on their choice of topic from a chapter of the text to provide a bridge between 1976 (book date of publication) and today (for both presentation and term papers). Other reference materials from the American Institute of the History of Pharmacy (Madison, Wisconsin) and additional resources as appropriate were made available by the instructor. Dr. Mack worked with each group on a weekly (and on an as needed) basis to shape presentations, maintain project focus, and develop additional reference materials for term papers. Short written assignments each week assisted in this objective.

During the last class session (expanded to two hours), the student groups gave their presentations (approximately 5-8 minutes presentation time for each student). This was followed by a discussion of the topic area moderated by Dr. Mack for its relevance and important concepts.

Term papers of 8-10 pages in length were collected December 7. Grading on a satisfactory/unsatisfactory basis was chosen by the students. The term papers were reviewed by the instructor and will be returned to the students with comments.

REQUIRED TEXT:

Glenn Sonnedecker, Kremers and Urdang's History of Pharmacy, Fourth Edition, 1976.

OVERALL IMPRESSIONS:

This is the third time I have taught this adjunct. The past quarter I gave the students a little more independence in shaping the group presentations and emphasized group dynamics/initiative. The class was *split* into students who were enthusiastic/self-motivated and those who were *shy* and wanted to be told everything to do. Having these two types of students work together made the overall group stronger.

NORTHEASTERN UNIVERSITY
Bouvé College of Pharmacy & Health Sciences

History of Pharmacy Outline

Dr. Eric J. Mack

- 1492 Columbus' voyage to the New World includes a surgeon.
- 1631 Van den Boogaert appointed barber-surgeon to New Amsterdam.
- 1646 George Starkey recent Harvard College graduate makes remedies based on oils of antimony (Sb), mercury (Hg), sulfur (S). Basis for most medicinals in Colonies/US until Civil War.

William Davis, physician, opens "apothecary" shop in Boston.
- 1663 Van Imbroch physician/apothecary opens shop in Kingston, NY.
- 1736 Virginia law recognizes the apothecary and the dispensing function.
- 1754 Jonathan Roberts in Philadelphia becomes the first chief hospital apothecary.
- 1755 John Morgan in Philadelphia becomes second chief hospital apothecary, quits after two years to attend medical.
- 1765 Morgan teaches lectures in pharmacy and pharmaceutical chemistry in Philadelphia, starts a school.
- 1775 Continental Congress establishes Army Hospital; staff includes 1 apothecary.
- 1777 Dr. John Morgan, director of Army hospital, appoints Andrew Craigie of Boston as Apothecary General.
- 1778 Dr. William Brown, borrowing from a Scottish book, writes the Lititz Pharmacopoeia, the first military drug formulary.
- 1784 Marshall family begins the manufacture of medicines for wholesale to apothecary shops in Philadelphia.
- 1808 Louisiana makes diploma and examination prerequisites for apothecary practice.
- 1818 South Carolina licenses apothecaries.
- 1820 US Pharmacopoeia published (official listing of drugs and drug standards; now in its 23rd revision/24th edition).
- 1821 Philadelphia College of Apothecaries organized to provide full-time instruction (known today as Philadelphia College of Pharmacy and Science).
- 1823 An association of pharmacists in Boston form Massachusetts College of Pharmacy for the purpose of giving lectures to pharmacists (incorporated in 1867 to provide full-time instruction; known today as Massachusetts College of Pharmacy and Allied Health Sciences).
- 1826 Pharmacy colleges award graduates the degree Graduate in Pharmacy (Ph.G.).
- 1841 George Smith (Philadelphia) starts a pharmaceutical manufacturing company (known today as SmithKline Beecham).
- 1852 American Pharmaceutical Association (APhA) founded.

- 1860 Sharpe and Dohme manufacturing company founded (see 1918; known today as Merck Sharpe & Dohme).
- 1867 Maine Pharmaceutical Association founded as the first state association (known today as Maine Pharmacy Association).
- 1868 University of Michigan starts 2 year program for pharmacists.
- 1870 Conference of Teaching Colleges of Pharmacy founded (succeeded by the American Association of Colleges of Pharmacy or AACP).
- 1876 Colonel Eli Lilly starts manufacturing company in Indianapolis.
- 1877 US Dispensatory published (formulas and instructions).
- 1883 National Retail Druggists Association founded as business society (known today as National Association of Retail Druggists or NARD).
- 1885 Joseph P. Remington publishes Practice of Pharmacy (known today as Remington's Pharmaceutical Sciences; now in its 18th edition)
- Massachusetts enacts its first regulations for pharmacists and pharmacy.
- 1888 APhA publishes National Formulary (list of drugs and formulas; now in its 18th edition).
- 1889 Merck Index (of drugs) published (now in its 11th edition).
- 1892 University of Wisconsin establishes 4 year program for pharmacists.
- 1898 Department of Law of the Evening Institute of Boston YMCA (see 1916, 1922; known today as Northeastern University).
- 1901 Charles Walgreen opens the first store in his chain of drug stores.
- 1902 University of Wisconsin awards the first Ph.D. in Pharmacy degree to prepare future faculty and scientists.
- 1904 National Association of Boards of Pharmacy (NABP) formed.
- 1905 New York Becomes first state to require college graduation for licensure.
- 1906 Federal Food and Drug Act adopted in response to bad meat and adulterated drugs.
- 1907 AACP adopts 2 year minimum college course for Ph.G. degree.
- Louis K. Liggett (Liggett-Rexall chain drug stores) founds United Drug Company (located at what is now the corner of Forsythe and Greenleaf on Northeastern University campus encompassing what are now Holmes, Lake, Meserve, Nightingale Halls; Ryder Hall is the former Research & Development building of the company).
- 1914 Harrison Narcotic Act adopted, restriction of opium and coca importation.
- 1916 Department of Law of the Evening Institute of the Boston YMCA becomes Northeastern College of the YMCA (see 1898, 1922; known today as Northeastern University).

- 1918 With World War I, German companies lose/sell US interest, patents seized. Sterling buys rights to Bayer aspirin; Schering goes independent; Sharpe and Dohme buy Merck.
- 1922 Northeastern College of the YMCAs becomes Northeastern University (see 1898, 1916).
- 1925 AACP requires 3 year college course for Pharmaceutical Chemist degree (Ph.C.)
- 1927 Meriano School of Pharmacy formed in Boston (see 1940, 1949, 1962; known today as Northeastern University Bouvé College of Pharmacy and Health Sciences).
- 1930 Bureau of Narcotics formed.
- 1932 AACP requires 4 year college course for B.S. in Pharmacy degree.
- 1938 Food, Drug and Cosmetic Act adopted in part because to 73 deaths in 1937 from a toxic elixir of sulfanilamide, requires drugs and cosmetics to be safe.
- 1940 Meriano School of Pharmacy becomes Boston School of Pharmacy (see 1927, 1949, 1962).
- 1942 American Society of Hospital Pharmacists (ASHP) founded.
- 1946 Mugar Hall on Northeastern University campus dedicated (used by Chemistry).
- 1948 Massachusetts becomes one of the last states to require high school diploma and college degree for pharmacist licensure.
- 1949 Boston School of Pharmacy becomes New England School of Pharmacy (see 1927, 1940, 1962).
- 1950 AACP debates requiring 6 year minimum vs current 4 year course; University of Southern California breaks precedent and adopts 6 year Pharm.D. degree program.
- 1958 Senator John Fitzgerald Kennedy gives graduation address at New England College of Pharmacy.
- 1960 AACP requires 5 year course for B.S. in Pharmacy degree.
First satellite pharmacy concept introduced at Long Beach (CA) Memorial Hospital by Don Carter (administrator).
- 1961 Medication error study completed by Barker and McConnell.
- 1962 Northeastern University absorbs New England College of Pharmacy (see 1927, 1940, 1949).
- 1963 Northeastern University rededicates Mugar Hall as Mugar Life Sciences Building housing the College of Pharmacy with the addition of the Peabody Health Professions Center.
- 1964 University of Kentucky Medical Center introduces unit dose concept and starts first Drug Information Center
- 1966 University of California, San Francisco, starts Pharmacy Services Project.
- 1968 Bureau of Narcotics becomes Bureau of Narcotics and Dangerous Drugs
Hospital-wide decentralized pharmacy services initiated at Long Beach (CA) Memorial Hospital.

- 1970 Comprehensive Drug Abuse Prevention and Control Act Passed by Congress; known as the Declaring War on Drugs Bill.
- National licensure examination adopted by NABP.
- 1973 Bureau of Narcotics and Dangerous Drugs becomes the Drug Enforcement Administration.
- 1974 National Study Commission on Pharmacy (Millis Commission).
- 1976 Medical Device Amendment passed by Congress; first regulation of medical devices.
- 1983 Orphan Drug Act passed by Congress; support for drugs to treat rare disorders.
- 1984 Drug Price Competition and Patent Term Restoration Act passed by Congress; provides for generic substitution with patent enhancement for innovator drug.
- 1986 Drug Export Amendments passed by Congress to respond to overseas concerns.
- 1988 Pharmaceutical Marketing Act passed by Congress; limits physician drug samples.
- 1989 AACP adopts 6 year minimum course in pharmacy for Doctor of Pharmacy (Pharm.D.) sole practitioner degree, will be phased in by colleges over extended period of time.
- 1990 OBRA '90 passed by Congress; provides for mandatory patient counseling by pharmacists; moratorium on Medicaid fee change.
- 1992 Commission to Implement Change in Pharmacy Education formed by AACP.
- Generic Drug Enforcement Act passed by Congress in response to generic drug scandal at FDA.
- Prescription Drug User Fee Act passed by Congress; designed to increase new drug approvals.
- 1993 Northeastern University approved Pharm.D. degree tracking program as first step toward Doctor of Pharmacy sole practitioner degree program.
- President Bill Clinton gives graduation address at Northeastern University.
- 1994 Northeastern University Pharmacy Program considers developing nontraditional Pharm.D. program for practicing pharmacists.
- 1995 Death caused by dosage calculation errors at Dana-Farber Clinic in Boston leads to major review by hospitals of procedures used to certify accurate dosing.
- Ken Barker at Auburn University completes study on pharmacist dosing errors; results broadcast on ABC's Primetime Live.
- Harvard Medical School completes study on dosing errors in the hospital; results broadcast on ABC's Night Line.

Appendix E

PCT 1777 Pharmaceutical Calculations Adjunct Fall 1996 Sophomore Pharmacy Honors Students

Ethics in Pharmacy

Dr. Eric J. Mack, Instructor
110 Mugar - 373-3207

The sophomore honors adjunct for fall quarter 1996 was taught by Dr. Eric J. Mack of the Department of Pharmaceutical Sciences. I consider discussions and role playing in ethics in pharmacy to be of great importance in recognizing and understanding the professionalism required of a pharmacist.

To meet the perceived objectives and skills required by an honors course, the student was involved in a classroom discussion session on background and skill development moderated by the instructor and prepared topical group presentations. At the time of registration for the course, students were provided with a preliminary copy of this course description. Students without computer searching/literacy skills were shown how to research appropriate reference material using the University's computer system, World Wide Web, and MedLine. Writing techniques skills and presentation skills/techniques were discussed by Dr. Mack.

At the beginning of the term the students divided themselves into six groups (emphasis on team work) based on their choice of a case study from a chapter of the text. The text provided a number of case studies regarding potential ethical situations that a pharmacist or pharmacy student might encounter on the job. Dr. Mack worked with each group on an as needed basis to shape case study reports.

Students were encouraged to use LYNX for correspondence and report submission with the instructor. Student groups were required to submit a case report providing a summary of the case and pro and con opinions of what the individual in the case study should do. The instructor then passed out to the class all of the case reports from the various groups with all names removed to remove potential bias. All students as individuals then were asked to review each case report and submit comments on all of the reports submitted. Those comments were then edited and case-specific comments returned to each group. Lastly, the groups submitted a final case report incorporating the comments received.

REQUIRED TEXT:

Ethical Responsibility in Pharmacy Practice, R.A. Buerki and L.D. Vottero, American Institute of the History of Pharmacy, 1994.

OVERALL IMPRESSIONS:

This is the fourth time I have taught this adjunct. This past quarter I changed the topic from history of pharmacy to ethics in pharmacy, which I thought to be of importance to the students' professional development. The topic worked very well and was considered appropriate and timely. I originally had the intention of conducting this class using internet conferencing software available through the Multimedia Studio. The students were resistant to the use of the new technology (most were not web proficient, some thought it would be embarrassing to be criticized in a format where their names would appear). I agreed to conduct information transfer by internet. I will strive next time to overcome these student fears and implement the newer technologies.

TEACHING HISTORY OF PHARMACY

W. Clarke Ridgway

It has been my experience over the past decade that the majority of our students have come to us predisposed to invest time and energy in the courses in the professional curriculum that are perceived as enhancing their knowledge and skills in the areas of pharmaceutical and clinical sciences. Conversely they have tended to express less interest in courses they view as not meeting the aforementioned objectives. This is, perhaps, an expected outcome of an admissions process that tends to preferentially select students who express an interest in and have demonstrated an aptitude for science-oriented course work. Seldom in admissions interviews have successful applicants stated a preference for courses in the social sciences or humanities.

Not surprisingly, these prejudices are changed very little during a student's academic career, as attested to by final-year student evaluations of our curriculum. Rare are the requests to increase non-science course offerings. Rather, the typical suggestion is for *more* pharmacology, therapeutics, or clinical monitoring, etc.

The dilemma, then, has been one of how to generate interest in a "non-science" course (such as the history of one's profession), in a populace clearly predisposed to ignoring such offerings. This is compounded by the fact that most of our students' last encounter with history was likely the American history survey course required in their junior year in high school. Thus, their knowledge base is typically quite shallow and their historical research skills virtually non-existent.

The solutions, admittedly still in process, I believe, focus on two related approaches. First, make it relevant, and second, make it hands-on. Admittedly, professional historians will decry the former,

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they're doing or learning now and how that was done or learned in some other time they are more likely to become interested in the topic (or, in today's parlance, more likely to claim "ownership" of the subject). The latter calls for using (as in handling) artifacts such as tools, books, botanical specimens, etc. This approach no doubt sends shivers down the spines of my curator colleagues, but the end result is a greater first-hand awareness of and appreciation for the development of the "art" or practice, of pharmacy and health care.

Two examples will, perhaps, demonstrate these connections. The first unit of the course is on Native American health care. In it we discuss not only the theory and practices of shaman-based medical care, but also prepare or demonstrate some of their dosage forms. For example, students might make a poultice using a base of *Avena sativa* (oats--cheap and readily accessible). This process demonstrates quite dramatically not only the originally intended external tenacity of such a concoction, but also the rationale for recommending a high-fiber diet based on oat bran. To this base are added one or more members of the species *Mentha*. These are not only readily available, but also illustrate why some species were no doubt originally tried as ingredients--their aroma. This then leads into a general introduction of both the basics of pharmacognosy (a course long absent from our curriculum) and modern herbal therapy (something every student has faced as an, admittedly, ignorant intern). The unit then concludes with an assignment requiring that the student work with references heretofore untouched. Each student picks a different herb or natural product, but one that is currently in the news. The student then creates a two- to three-page report that covers such areas as morphology, pharmacologically active chemical constituents, therapeutic indications, precautions, and toxicology. Students are given a list of references to use. This list includes several pharmacognosy-related texts, *Honest Herbal*, *Herbs of Choice*, and *Lawrence Review* (see Appendix A).

The second involves a unit on sectarian medicine. After examining nineteenth-century homeopathic kits and pharmacopeias, students next examine currently marketed homeopathic

products (obtained from local pharmacies). A general discussion then ensues regarding past and current legal issues such as labeling. Likewise, after examining Thomsonian and later botanical literature, students then move to the Lloyd brothers and late nineteenth-century botanically-based pharmaceuticals, using Lloyd's Specifics and early Lilly and Parke-Davis products and catalogs. This leads into an examination of currently marketed herbal products (also obtained from local pharmacies) and a discussion revolving around production, standardization, and labeling issues. The unit concludes with an assignment that the students come to enjoy--the conduction and transcription of an oral history (see Appendix E). The subject is an elderly person in their family or community. The topic is past use of home remedies. Interviewees enjoy the interaction with the students, and the students gain a vivid impression of what health care was like in isolated communities in rural West Virginia at the turn of the century. Students follow scripted questions and prepare a two- to three-page summary.

Augmenting lectures with slides (I use 100's, most of which were copied from AIHP files), movies, and videos assist those students who are primarily visual learners. Using dosage forms tools and equipment, examining old OTC and Rx products, and leafing through decades-old references and textbooks not only helps those students who are tactile learners, but lets all students "see" history, or change over time.

Our course usually meets for two hours each week in the School's museum. This room houses the book, artifact, botanical specimen, and images collections. Occasionally, the group meets in the rare book room of the library or in one of the laboratories for demonstrations.

Additional writing assignments introduce students to other types of historical sources, both primary and secondary. In primary sources, old journals and hometown newspapers hold unusual fascination for many students (see Appendix B). I recommend accessing antiquarian primary sources via the Nydia King *Sources for the History of Pharmacy* microfiche (available through AIHP), since

actual texts are rare, expensive, and often in poor condition.

Secondary sources are more readily available in most health sciences libraries. For secondary journal articles, our students use *Pharmacy in History*, *Bulletin of the History of Medicine*, *Journal of the History of Medicine and the Allied Sciences*, and *Medical History* (see Appendix C and D). Students may also review a book-length secondary source. While these are plentiful in most health sciences libraries, students usually do not choose this option, given the amount of time required. Students choosing to review a book are given a list of suggested works. Students may also conduct an oral history of an elderly pharmacist. The object of these assignments is not to produce trained historians, but simply to acquaint them with the tools of the trade.

Student grades are based primarily on their performance on two exams, one given around midterm, the second during final exam week. Each exam typically requires two hours for completion, due to the short-answer essay-style questions. The remainder of the grade is determined by the quality of the written reports. Most students earn grades of A or B. Class size has ranged from as few as four to as many as thirty.

Student evaluations of the course generally range from good to excellent. The most commonly used descriptive phrase is "very interesting." Perhaps from such seeds historical oaks may grow.

Appendix A

HERBAL DRUG WRITING ASSIGNMENT

Choose one of the herbs listed below and research its use (past and/or present) as a home remedy.

Ginger

Saw Palmetto

Ipecac

Chamomile

Garlic

Ginkgo

Valerian

Capsicum

Black Cohosh

Yohimbe

Colchicum

Witch Hazel

Aloe

Sanguinaria

Echinacea

Podophyllum

Pacific Yew

Sassafras

Ginseng

Feverfew

Clove

Pennyroyal

Melatonin

Results of the research should be written up in the following format:

Description: Photocopy, drawing, or brief description of plant or plant part

History:

Active constituents:

Current usage:

Toxicology:

Information can be obtained from the references listed under "Herbal Bibliography"

Herbal Bibliography

Herbs of Choice: The Therapeutic Use of Phytomedicinals, Tyler, Varro E., Haworth Press, New York, 1994.

The Honest Herbal, Tyler, Varro E., Haworth Press, New York, 3rd ed. 1993.

A Field Guide to Medicinal Plants: Eastern and Central North America, Foster, Steven, and Duke, James A., The Peterson Field Guide Series, Houghton Mifflin Co., New York, 1990.

Medicinal Plants of the Pacific West, 1993

Medicinal Plants of the Mountain West, 1979

Medicinal Plants of the Desert and Canyon West, 1989, all by Michael Moore

Handbook of Medicinal Herbs, Duke, James A., CRC Press.

HerbalGram, quarterly publication of the American Botanical Council and the Herb Research Foundation.

German Commission E Monographs--American Botanical Council's English Translation of 410 German Commission E Monographs collated into a single volume.

Trease and Evans' Pharmacognosy, Evans, W. C., Bailliere Tindall, London, 13th ed., 1989.

Pharmacognosy, Tyler, Varro, E., Brady, Lynn R., and Robbers, James E., Lea & Febiger, Philadelphia, 9th ed., 1988.

The Lawrence Review of Natural Products, monthly monographs published by Pharmaceutical Information Associates, Ltd.

A Guide to Medicinal Plants of Appalachia, U.S.D.A. Forest Service Research Paper NE-138.

For historical usages, see

U.S. Dispensatory- older editions

American Medicinal Plants, Millspaugh, Charles F., 1892, reprinted by Dover Publications, Inc., New York, 1974.

Individual plant monographs published by Lloyd Brothers--late nineteenth-century and early 20th century.

Pharmacographia: A History of the Principal Drugs of Vegetable Origin, met with in Great Britain and British India, Fluckiger, Friedrich A., Hanbury, Daniel, Macmillan and Co., London, 2nd ed., 1879.

Appendix B

Pharmacy 283 History of Pharmacy

ASSIGNMENT:

Read and summarize an article from a primary pharmacy source, journal (article length), written before 1960.

SIGNIFICANCE:

Many of pharmacy's problems and concerns seem to recur over time, often in a slightly modified form. So, too, do the efforts to solve these problems and to prevent them from returning. For this exercise, you are to read an article from an old pharmacy journal and summarize the contents in no more than two pages.

Suitable subjects include: efforts to organize the profession, to standardize (or not) pharmacy education, to control (or not) prescription pricing, to train (or not) sub-professionals, to control use of addicting drugs, to alter (or not) business practices. In your summary, compare and/or contrast the view expressed in the article with any present-day arguments on the same subject.

- OR -

Select an article dealing with a drug or pharmaceutical product or process. In addition to summarizing the article, include a comparison with modern-day use of the drug or process (ex.: an 1870's article on the use of chloral hydrate might mention strengths, dosage forms, indications, precautions, etc. Compare these with the present-day use of chloral hydrate).

If the article discusses a botanical product, include a summary of the chemical constituents of that plant, as described in *Pharmacognosy* by Trease and Evans (1983), or *Pharmacognosy* by Tyler, Brady and Robbers (1981) both available in the Medical Center Library.

SUGGESTED JOURNALS:

American Journal of Pharmacy

Pharmaceutical Era

Druggists' Circular and Chemical Gazette

West Virginia Pharmacist

The Virginia Pharmacist

Lloydia

Journal of the American Pharmaceutical Association (1912-1939), Scientific Edition (1940-1960), Practical Pharmacy Edition (1940-1960)

Pharmaceutical Abstracts (1935-1948)

New Remedies

Pharmaceutical Journal

West Virginia Medical Journal

Journal of the American Medical Association

New England Journal of Medicine
Lancet
The Druggist
Therapeutical Gazette
American Professional Pharmacist
American Medical Reporter
Eclectic Medical Journal
Boston Medical and Surgical Journal
American Medical Times
American Druggist
Drug Topics
*Proceedings of the A.Ph.A. (1852-1911)**
*Yearbook of the A.Ph.A. (1912-1934)**
*Transactions of the A.M.A.**

*These works are the official records of the annual meetings of these groups and include resolutions, floor debates, committee reports, speeches, etc. If you choose one of these publications, summarize the floor debates on any one subject, or summarize a committee report and its ultimate fate.

Appendix C

Pharmacy 283 History of Pharmacy

ASSIGNMENT:

Read and summarize an article dealing with pharmacy or drug use from a secondary source of historical information.

SIGNIFICANCE:

Secondary sources are those articles, essays, monographs, etc. written by persons not personally involved with the activity being described. The authors are usually historians, and are writing on a topic they have researched from a number of different primary and secondary sources. As such, these authors can often approach and analyze their subject from a number of angles, and can give a more complete account of a person or event than any single source can. Their value also lies in the ability of the author to present hypotheses or conclusions on one topic that may have relevance to other subject as well.

PROCEDURE:

Choose any of the journals listed below. Read one article, and summarize the contents in no more than three pages.

Please note the limitations--on non-pharmacy journals, use an article dealing with drug use or therapeutics or other pharmacy related subjects. Be sure to clear your article with me beforehand.

All the journals listed below are available in the Medical Center Library.

SUGGESTED JOURNALS:

Pharmacy in History--published by the American Institute of the History of Pharmacy. (Any article greater than five pages in length is acceptable.)

Bulletin of the History of Medicine--contains many fine articles on pharmacy and drugs.

Journal of the History of Medicine and the Allied Sciences--similar to the *BHM* cited above.

Journal of the History of Biology--has occasional articles on drug investigations pharmacology, or on persons active in these fields.

Medical History--similar to the *BHM* and *JHMAS*. (English)

Interested in a particular topic? Use the *Index Catalogue of the Library of the Surgeon General's Office*, *Index Medicus*, or *Bibliography of the History of Medicine*; all available in the Medical Center Library.

Appendix D

Pharmacy 283 History of Pharmacy

ASSIGNMENT:

Read and summarize information of a pharmaceutical nature obtained from primary sources of a popular genre.

SOURCES:

Newspapers, popular journals or magazines, pamphlets.

PROCEDURE:

Scan a newspaper or magazine that was published 25, 50, 75, or 100 years ago on or near your birthday. (Example: If you were born on September 10, 1966, read a newspaper published September 10, 1961, 1936, 1911, or 1886; OR read a magazine published in September of 1961, 1936, 1911, or 1886.)

If you choose to read a newspaper, summarize any article it contains dealing with the health care of the times. This may concern any local epidemics that might be in progress, the causes of death if listed in the obituaries, health programs in the local schools or community, etc. It may be necessary to scan several issues before or after your birth date to locate such items.

Secondly, note the advertisements for local pharmacies or OTC drug products that appear. Compare these advertisements with today's papers. Summarize the differences and similarities as to style, content, use of artwork, etc. One page should be sufficient to cover this topic.

If you choose a magazine or journal article, summarize the contents in a one- or two-page report. Popular magazines such as *Life*, *Look*, *The Saturday Evening Post*, *Colliers*, *Time*, *Newsweek*, etc. will give you a look at what the average American was exposed to in terms of drugs and health care. Be sure to pick an article pertaining to the use of medications. This may include new drugs on the market, the overuse or abuse of drugs, legislation concerning drugs, activities of the professional organizations of pharmacy, or articles on the manufacturing, pricing, or distribution of medicines.

Be sure to include the name of the newspaper or magazine and the date of the issue that you are citing.

Newspaper should be from your hometown, if possible. County papers will suffice for those from towns too small to issue their own. Colson Hall (second floor, West Virginia Collection) contains on microfilm, copies of dozens of small town newspapers. Check with the librarian at the desk opposite the door on the second floor on how to use these microfilms.

Students not from the West Virginia/Appalachian area may use the *New York Times*, *Washington Post* or other large city newspaper.

Appendix E

Pharmacy 283
History of Pharmacy
Guide Sheet for Folk Medicine
Oral History Assignment

PURPOSE:

To collect first-hand recollections of Appalachian folk medicine; the kind practiced without professional advice and handed down by laymen from one generation to the next.

INTERVIEWEE:

Select one of the oldest people you know. The subject may be a relative, friend, or neighbor. Contacting your subject and explaining the purpose of the interview prior to the visit itself may aid him/her in recalling favorite family home remedies. If the subject is an immigrant to this country, ask them what remedies their family used in their country of origin and if they continued using them after immigration or if they changed and how.

COURSE CREDIT:

To receive credit for this exercise, the student must submit a written report of the interview and summarize his/her findings in a short oral report in class.

WRITTEN REPORT:

Include the name and address of the interviewee and the time and date of the interview. Two or three pages will be sufficient.

This report will become part of a file of Appalachian Folk Medicine to be housed in the School of Pharmacy.

Pharmacy 283
History of Pharmacy

Hints On Conducting An Interview

1. Use a tape recorder or take brief notes. Write up the most useable parts immediately following the interview.
2. Tell the person specifically what you are interested in, and why. Use a "warm-up" question to guide the person's reminiscences in the right direction--such as the worst epidemic of personal memory, or what the drugstore was like in his/her youth.
3. Keep your questions brief, asking only one at a time. Ask open-ended questions that invite detailed responses; not questions that can be answered with a brief yes or no.
Ex.: "Could you tell me about . . . ?" "What was it like . . . ?" "How did your parents treat your . . . ? (cold, stomach ache, cut, etc.)."
4. Prepare your questions in advance of the interview, but ask them in a natural, relaxed style.
5. Elderly persons sometimes need a few moments to recollect or add to a response. Periods of silence are to be expected--don't jump in with another question.
6. Once you've obtained the remedy or belief to treat or prevent a disease, try to elicit where the person learned about it and from whom. Also try to determine the last time (by decade) they used the remedy and why (if) it was given up.
7. Attempt to find out what remedies the subject's grandparents or an elderly family friend may have used. If successful, such information could easily span a century or more.
8. You might want to include the subject's spouse; sometimes two memories are more efficient than one.
9. Be sure to thank the interviewee for their time. You may even offer to provide them with a copy of your report as a courtesy.

REMEMBER: You will be perceived as a representative of West Virginia University as well as a student. Proper attire and etiquette are a necessity.

Pharmacy 283
History of Pharmacy

Guide Sheet for Pharmacist's
Oral History Assignment

PURPOSE:

To collect first-hand information on the teaching and practice of pharmacy.

INTERVIEWEE:

Select one of the oldest pharmacists you know.

FORMAT:

Follow the general guidelines of interviewing contained in the guide sheet for Appalachian Folk remedies.

COURSE CREDIT:

To receive credit for this exercise, the student must submit a written report of the interview and summarize his/her findings in a short oral report in class.

WRITTEN REPORT:

Include the name and address of the interviewee and the time and date of the interview. Two or three pages will be sufficient.

Pharmacy 283
History of Pharmacy

Hints of Conducting the Interview

1. If the pharmacist is still actively employed--call or write ahead of time to arrange a meeting.
2. You may ask more detailed questions.
3. Subjects to cover:
 - a. the person's earliest memory of a drug store
 - b. why he/she chose pharmacy
 - c. their educational background (what types of courses, how were they taught, how useful were they, etc.)
 - d. work settings
 - e. changes they have observed in: types of prescriptions filled, public attitudes, business practices
 - f. unusual or humorous incidents
 - g. would they choose pharmacy over again if they were just starting out then and today
 - h. any personal philosophy or words of wisdom they would like to pass on to today's students

APPROACH TO HISTORY, USE OF RESOURCES, EVALUATION TECHNIQUES, OVERALL PHILOSOPHY

John Scarborough

First the preliminaries that will signal my approach to the history of pharmacy. As many of you know, I have a dual educational and training background in medicine and in classics and ancient history, and I regard pharmacy in antiquity and the Middle Ages (both East and West) as basically inseparable. Good Byzantine physicians (*e.g.*, Alexander of Tralles of the sixth century) are excellent practitioners in almost all regards including the compounding of drugs (anyone wishing proof of this bald statement need merely look up the Theodor Puschmann edition of Alexander of Tralles [in Greek and German]), and dosage forms, drug preparation (frequently “on the spot” as Galen says), timing of administration, and the actual units used in weights and measures are too obvious to miss. All of this signals my approach to history as a whole and the history of pharmacy and medicine in particular: to comprehend many if not most of the particulars of a particular author (*e.g.*, *my* favorite Dioscorides of Anazarbus of the first century), one must also know the history of the time and culture in which the practicing physician/pharmacist functioned. Dioscorides is an exception, I am well aware: he demands that the good doctor must also be a field botanist, must do his on-the-spot research on what works and what doesn’t in spite of the local tales he hears and may even record. His method of what John Riddle has labeled a drug affinity system for the classification of drugs was followed by few physicians, although the diarrhea-of-the-pen Galen grants great respect to the accu-

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racy of observations of the great Anazarban. Most importantly, however, it is Dioscorides's acute observations of what transpired when given drugs are administered for particular diseases or afflictions, and repeated expediences of this kind will allow him to record in his *Materia Medica* of A.D. 70 that "I have witnessed its success" or maybe some less enthusiastically, "I have not observed many beneficial outcomes from use of this *pharmakon*." One famous example is what Dioscorides thinks about the opium poppy (*Papaver somniferum* L.). His description is the best before Mattioli (whose Renaissance commentaries on Dioscorides were the last and best of *that* genre produced before the overwhelming numbers of new plants streaming into Europe from the New World and Asia made the "old" botany of Theophrastus absolutely inadequate and Mattioli's several editions in the sixteenth century simply added to the mass of data, rather than clarifying it), and in my research on the opium poppy (and a number of other aspects of Greek, Roman, Byzantine, and classical Arabic pharmacy) has shown me that pharmacy was a constantly changing aspect of the *medical* profession. Pharmacy becomes separated--no surprise this--once market regulations were established in Muslim countries in the Middle Ages (the famous *hisba* rules): officials were charged by the sultan or caliph to ensure that the customer was, indeed, buying what the seller said he was purchasing; again, however, even the *hisba* rules indicate a widespread knowledge of drugs and exotic foodstuffs. Pharmacy and medicine are interlocked until a few of the northern Italian city-states began to issue certificates to "spicers" (perhaps as early as the thirteenth century), but both Muslim and Byzantine hospitals each had their own "pharmacists' shop," in which drugs were prepared on demand by chief physicians. Byzantium's Pantokrator Xenon of the twelfth century is, perhaps the most famous. According to the *Typikon* ("rule book") of the monastic order which ran the hospital, one finds not only specialists who could repair hernias, gynecological and obstetric care, quasi-sanitary practice

(e.g., beds were cleaned once a month), but also clear identification of what today would be called “house officers” who directed matters of drugs, their compounding, and their supply from local sources or procured as exotics from far-flung trade. One reads of a chief pharmacist (the *epistekōn*) and his two assistants--or apprentices, the *perissoi*. There are additional texts in Arabic also demonstrating similar “house officers” in the Muslim hospital (a *maristān*) and one can trace the gradual separation of pharmacy from medicine as fewer and fewer doctors followed Dioscorides’s maxims or the painstaking medical botany so beautifully published in four editions of commentaries on Dioscorides in the sixteenth century. The new chemistry of Lavoisier demolished the venerated Aristotelian elements, the new botany of Linnaeus replaced the medical botany of both Theophrastus and Dioscorides, so that by the nineteenth century, one begins to discern faint outlines of a pharmacy “profession,” blown large after Pasteur’s proofs of fermentation and Koch’s postulates demonstrating how one disease could be reproduced and then reintroduced into patients and experimental animals. Pharmacy as a profession certainly existed in antiquity, *if* one chooses to include the *rhizotomoi* (“rootcutters”) used as folk medical sources by Theophrastus, or the *pharmakopolai* (“drug sellers”) often mentioned in Greek and Latin texts as hawking their wares in special stalls set aside for them in the *forum* (Latin west) or *agora* (Greek east). Drug fraud was rampant, so the best defense was to know what you were looking for, much as we see folk squeezing oranges in the market today.

All texts (Greek, Latin, Arabic in the original; French, German, Italian, etc. for modern interpretations) which mention or focus on drugs of whatever variety are my sources, so that if I choose to study laudanum in the nineteenth century, my scope will include who used it and why, and why the medical profession so valued it even knowing its addictive properties. The new botany after Linnaeus, the new chemistry after Lavoisier, and the revolutionary aspects of microbiology after

Pasteur, the discovery of vitamins, and the use of antibiotics (one could, of course add many more specifics for the period after 1850 or so) are all part of this, so that my students receive a most important lesson about science as a whole and pharmacy in particular: It is always--as Aristotle noted--always in a flux of change as new data flow into a study. More evidence means shifting dogmas, new plants in the sixteenth century meant attempts to "fit" the old with the new (which failed), and microbiology shifted that focus in the nineteenth century, much as is molecular genetics shifting our views in the late twentieth century. Change. What today is science fiction, tomorrow could and may be accepted dogma, in turn challenged as seems to be the function of science in its truest form, first enunciated in ancient Greece.

My resources for teaching the history of pharmacy from dim antiquity through the twentieth century are simple: from my own research, I have prepared a set of "lecture notes" which are given to each of our 150 students, and those notes form the core of the course. I obtain occasional evaluations (both written and oral), and shift emphases as such seem warranted. The "lecture notes" obviate overhead projectors or other mechanical means, since the student has before him the who, what, when, where, and why I think why. It seems to work.

Panel Discussion: Teaching the History of Pharmacy Today
Moderated by Robert A. Buerki

The Future of the History of Pharmacy in Professional Curricula
by John L. Colaizzi

Teaching the History of Pharmacy: Is There A Future?
by Eric J. Mack

Future of the History of Pharmacy in Professional Curricula
by W. Clarke Ridgway

The Future of the History of Pharmacy
by John Scarborough

THE FUTURE OF THE HISTORY OF PHARMACY IN THE PROFESSIONAL CURRICULUM

John L. Colaizzi

In the ACPE Accreditation Standards and Guidelines for the professional program leading to the Doctor of Pharmacy degree (adopted June 14, 1997), standard number 11 (curricular content) includes the history of pharmacy as one of the content areas within the behavioral, social and administrative pharmacy sciences, one of five core content areas of the curriculum. The increased emphasis on pharmaceutical care as the underlying basis for pharmacy practice and for the pharmaceutical curriculum makes the teaching of the history of pharmacy within the professional program more important than ever before. A greater emphasis on the social sciences, including historical studies, as applied to professional practice, has been evident in the curricula of medical schools in recent years. In 1997, AACP's Commission to Implement Change in Pharmaceutical Education issued a position paper entitled "Maintaining Our Commitment to Change." This paper updates the earlier report of the Commission issued in 1993, "Entry-Level Curricular Outcomes, Curricular Content and Educational Process," which has been widely used as a basis for curricular reform as American schools and colleges of pharmacy transition to the Doctor of Pharmacy as the sole professional degree. This 1997 position paper was issued to ensure that the Commission's earlier recommendations remain current in light of the wrenching changes that have occurred in health care over the last five years, brought on by the escalating and pervasive impact of managed care. The 1997 position paper reorganized and broadened the educational outcomes published in the Commission's earlier paper into six categories. Of the six categories, two are areas that will benefit from inclusion of curricular content designated to inculcate an appreciation of the history of

pharmacy among our students:

- Understanding health-care policy, organization, financing, regulation, and delivery.
- Understanding and appreciating cultural diversity.

The study of the history of pharmacy helps students to develop a framework for understanding health-care policy, organization, financing, regulation, and delivery by placing these issues into a historical context, and by noting the tensions and dynamics that have existed and evolved over a period of time between pharmacy and the prevailing health-care system and philosophy, between pharmacists and the practitioners of other professions, and between pharmacists and the public. The Commission's position paper states that "students should be able to understand systems of care including forces of change within healthcare." I believe that the study of the profession from a historical perspective definitely enhances students' understanding of the systems of care and the social, economic, legal, ethical, political, scientific, and technical forces of change within health care, and the particular place of pharmacy as related to these systems and changes.

In terms of appreciating cultural diversity, the 1997 Commission report points out that students need to develop "personal awareness and social responsibility" and "facility with ethical principles" in dealing with patients and practitioners of ethnic backgrounds differing from their own. This, too, comes from a study of the history of pharmacy as one recognizes that neither triumphs and discoveries nor errors and tragedies, have been the exclusive domain of any one ethnic or racial group throughout the history of health care.

Most students find the course in the history of pharmacy to be a refreshing respite from their technical and scientific courses, and they find it to be interesting and fun. While that might be reason enough for inclusion of such courses within the curriculum, the specific values from studying the

history of pharmacy go quite beyond that.

I see the specific values from the inclusion of curricular content in the history of pharmacy within the professional curricula to be the following:

- To develop an appreciation for the concept of what a profession is and to establish the specific professional identity of the pharmacist.
- To enable the pharmacist to better deal with change in a positive manner.
- To enable pharmacists to better appreciate and deal with multiculturalism in the practice of a profession.
- To significantly assist the pharmacist to develop a strong ethical base.
- To enable the professional practitioner to come to grips with the limitations that he or she faces within a profession.

I believe that it is very helpful for teachers of history of pharmacy courses in the professional curriculum to have a strong identity with the profession. They should ideally be pharmacists who have a fairly broad base of professional pharmacy experience. This is not to say that professional historians do not have a very important role to play in the teaching of these courses. Certainly they should be the mainstay of a course that is primarily addressing the history of pharmacy as a specialty discipline, especially at the graduate level. However, within the professional curriculum, I feel that the teacher who has a strong sense of identity with the practice of the profession of pharmacy, as well as an interest and knowledge in the history of pharmacy, though not necessarily as his or her own primary discipline, can give the course the relevancy to the profession and to professional practice that will excite pharmacy students and make the course more valuable to them. The teacher needs to have a real feel for the problems that the profession faces at the present time, the trends that are shaping the profession, as well as the challenges and opportunities, and how these have changed over

time and how they relate to the history of the profession. The instructor also needs to have a significant pride and sense of personal ownership in the profession to be able to teach the course from this point of view.

Although the inclusion of history as a component of another course is better than omitting it completely, I feel that a specific course dedicated to the history of pharmacy is far more effective in terms of the desired educational outcomes. I believe that students need to develop an ability to begin to actually think from a historical context, and to analyze problems within a historical framework, in order to develop an appreciation for the important applications and value of the study of the history of pharmacy to their professional identity and practice. Without taking a course specifically titled the history of pharmacy, it is less likely that this will happen.

To a significant degree, enabling the history of pharmacy to emerge as a strong component of the professional curriculum in the future will be the responsibility of the AIHP and its members. This can be accomplished through the development of resources to assist the cadre of instructors who are not likely to be specialists in the discipline of the history of pharmacy in the teaching of the course. The development of course syllabi, of slides and videotapes, of material on the Internet, and of textbooks or chapters of textbooks, will all be important. Also, facilitating and supporting the availability of pharmaceutical or health-care historians who are, in fact, disciplinary specialists and experts in the history of pharmacy, to serve as guest lecturers and visiting faculty for the teaching of the history of pharmacy will also be helpful.

I feel that in view of the current trends and changes in the profession of pharmacy and in health care generally, the importance and value of the history of pharmacy as a content area within the professional curriculum is greater than it has ever been. The opportunities for expansion of

teaching of the history of pharmacy within the professional curricula are promising in the years ahead.

TEACHING THE HISTORY OF PHARMACY: IS THERE A FUTURE?

Eric J. Mack

In order to implement the entry level Doctor of Pharmacy program, the curriculum must become compacted. This pressure results in general reduction of professional electives allowed. This reduction leads to a loss of electives offered. Many new curricula are trying to use professional electives as substitutes for material formerly presented in required classes in order to create practice tracks: clinical, institutional, community, managed care, research, manufacturing, administrative, etc. I have yet to see a practice track entitled the humanities or esthetics. In a compacted curriculum there may be little room for formal courses in the history of pharmacy. Must such wisdom wither and die?

The answer is no. There is room for history of pharmacy in a curriculum, not as a formal course, but rather as material linked by the historical thread and disseminated throughout the curriculum.

In my chosen field of pharmaceuticals, knowledge of the history of dosage forms and their administration form the basis for understanding the purpose, nature, and formulation of the various dosage forms in use today. Historical perspective provides the relevance for a given topic area and the beginning point for discussion of the topic in the present day. This is the method I have employed and will continue to employ to foster interest in the history of pharmacy in my classes. My students fold powder papers and are intrigued when I tell them that powder papers are still a popular dosage form in the Southern United States.

Until the mid-1970s, pharmacy classes at most institutions tended to be small and the students

brought a certain personal motivation (history of family involvement, practical experience) for being in pharmacy that promoted pride in the profession and an interest in the history of pharmacy. Capitation funding, an interesting outgrowth of the Carter administration, produced an explosion in class size that may have diluted personal interest. Most of my classmates had little personal relationship with pharmacy prior to entry into the pharmacy program. This trend has continued to this day; few students have worked in a pharmacy prior to entry. Truly rare is the student from a family-owned pharmacy.

Is it surprising that there is not a clamor for learning of the history of pharmacy at many pharmacy schools? How many individuals are adequately trained to teach the history of pharmacy? In a time of limited resources, what can be done?

AIHP has been superb in its dedication to the production of first-class materials promoting the history of pharmacy. We need to find methods to disseminate these materials and entice students to want to learn more about pharmacy's origins. Most major issues in pharmacy today are not new. Their historical basis would tend to enlighten individual understanding. Physician vs. pharmacist is not a new concept; its origins created American pharmacy as a separate, free-standing profession. The debate about pharmacy as a relevant profession was fueled by Chief Justice Burger's analogy of pharmacy's lack of standing as a profession to the service rendered by a clerk in a book store selling law books.

One method for fostering interest in the history of pharmacy may be to work closely with APhA's Academy of Students of Pharmacy, NCPA/NARD student chapters, Rho Chi Honor Society, and pharmacy fraternities and sororities to promote history as being important to professional development. Teaching can take many forms, all fruitful as long as learning takes place.

Is there a future to teaching the history of pharmacy? The answer is yes. The format may be different, but learning the historical perspective is one of the keys to personal and professional development.

FUTURE OF HISTORY OF PHARMACY IN THE PROFESSIONAL CURRICULA

W. Clarke Ridgway

The future of teaching the history of pharmacy will revolve around the same two interrelated phenomena that it always has: the first being the identification and attraction of persons interested in teaching the subject, and the second being the training and equipping of these persons.

The first objective should not be all that difficult, as most schools will usually harbor at least one faculty member with an amateur interest in the subject. Should none exist, then the surrounding community (if of moderate size or larger) will almost certainly contain one or more persons interested in history in general, and possibly the history of things of a medical bent. In the unlikely event no one meets these descriptions, then current telecommunications and CD-ROM technology are certainly capable of bringing the subject into any campus. What then, are the barriers to these options?

For junior full-time, tenure-track faculty, time and energy devoted to historical pursuits generally carry little weight with most promotion and tenure criteria. If these faculty are to be expected to teach history, they must be equipped to do so in a manner that requires relatively little effort or research. Methods that provide "canned" lectures, videos, and simple demonstrations would do so. These faculty typically have little opportunity to obtain off-campus training in teaching history, since they do not qualify for sabbaticals and rarely have the time or funds to do so on their own. This is not likely to change.

Senior tenured faculty, by comparison, have the luxury of being able to indulge (relatively speaking) their historical interests to some degree, but even this time is under increasing pressure to

be productive in other areas. While it may be possible to provide them with a higher level of off-campus training (*e.g.*, the Teaching Improvement Award), schools are likely to prefer to invest their sabbatical dollars in areas more conducive to future financial payback. This situation is not likely to change any time soon, if at all. Again, providing these persons with complete teaching modules may also be necessary, albeit they could be supplemented with off-campus "short-courses."

As for the community, truly amateur historian, unaccustomed to preparing and delivering educational materials in a structured format, the need for pre-designed and constructed modules is greatest. Over time these individuals can become adept instructors if given the proper support and acknowledgment. Their relative low cost would make such persons attractive to those schools who wish to offer such a course but whose budgets preclude devoting even a modicum of faculty salary monies to such endeavors.

In any event, if history of pharmacy topics are to survive, they will do so only if offered in a user-friendly, universally applicable technology at a relatively low cost. How will this be possible? On the one hand, persons and organizations with a vested interest in the survival of historical studies (professional historians and their associations) must be called upon to lend their expertise to the creation of these self-contained teaching modules so as to assure their accuracy and overall quality. In so doing production would be accomplished with maximum efficiency, for these persons are most knowledgeable about what resources would best showcase a particular topic. Organizations can ensure the overall continuity and quality of the component modules. Once created, these modules could then be effectively marketed by the organization(s) involved.

For their part, schools can help ensure the survival of their professional legacy by procuring these programs and facilitating their utilization. Funding for such procurements could be aided by

the help of interested alumni, who could designate donations for the purchase of these materials and perhaps be honored or memorialized in the process.

Production costs could be underwritten by corporate or foundation funding, similar to those efforts undertaken by Glaxo-Wellcome in its highly successful *Medicines: The Inside Story* project. Such efforts would carry a long-term measure of good will.

As to which technologies to use, the answer lies in costs of production, reproduction, and usage. Manuals are relatively inexpensive to produce, can be reproduced also inexpensively, and can be relatively easily changed or updated. Manuals, however, have a limited life span in that they can be used by only a few students or student groups before destructing. Audio tapes are cheap to make, reproduce and alter, but lack the visual stimulation so many view as essential to learning. They, too, have limited lifespans. Videotapes are more expensive to produce, but like audiotapes, are inexpensive to reproduce. They are, however, more difficult to update and they, too, have a limited lifespan. The advantages to using CD-ROM technology are its relatively low cost of reproduction and high degree of durability. Several discs could be enough for an entire class if it progressed self-paced. The disadvantages are the relative unalterability of content once produced and the high cost of initial production. Given the nature of historical research (as opposed to that of, say therapeutics) the lack of content flexibility should be of minor concern. Production costs do create a formidable barrier.

Satellite transmission of course content is too expensive to consider at this time. Possible advances in telecommunications do offer another set of transfer, but will, likely be initially quite costly.

THE FUTURE OF HISTORY OF PHARMACY

John Scarborough

Ah, yes, the "future" of the history of pharmacy. A sore point for me, since here at Wisconsin, I am teaching the last group of students who are required to take the history of pharmacy in order that they may obtain a degree. Many are Ph-1 students, but there are many who are medical students, or history of science majors, and, of course, those who have not been able to take Social and Administrative Pharmacy 401 as first-year students, and are now making up the requirement. I am saddened, indeed, that the future of the specialty appears as it does: marginalized at best. I would predict that in the coming years, the enrollment for the history of pharmacy course will drop from the normal 150 or so to (maybe [here's hoping!]) 30 students who are innately curious about the history of their profession. We have but one fairly decent (maybe two) texts in the history of pharmacy written in English, and the best secondary sources (surprise!) are those in German published before World War I. That's no typo: I, not II.

In our new Pharm.D. program, "any history" will satisfy the pre-pharmacy entrance requirements (the literal truth), so that our graduates may one day know something of the Spanish conquest of Aztecs and Incas but nothing much about why quinine remains so useful and where it came from and why. If they chance to take Latin America as the "history" pre-requirement. All of this amazes me. In my courses in Greek and Roman Medicine and Pharmacy (Social and Administrative Pharmacy 561), I always have at least 50 students from the broad mix of majors characteristic of the University of Wisconsin, and in the Byzantine Medicine and Pharmacy (Social and Administrative Pharmacy 562), I now have 35 students, many of whom are (as always seems to

be the case) some of the brightest and inquisitive I could imagine. We all derive great pleasure when an art history major debates a philosophy major on the "meaning" of whatever is the topic for the week, and students seem to have problems only when we enter the world of medieval Arabic medicine, perhaps due to the strange "non-Indo-European" terms, authorities, and other matters. Old Church Slavonic (medieval Kiev and the like) seems to bother them less, but maybe since Russian is a kindred language, this may be the simple explanation of the contrast.

Pharmacy is not alone in "dropping" history from its requirements. I know of no other university anywhere in world (my ignorance of continental European curricula may be showing here) that requires the history of medicine or the history of pharmacy to obtain a degree. We now have "electives." The obverse, to me, is suggested by the pharmacy students who show up for our "electives" at Wisconsin in Greek and Roman Medicine and Pharmacy, and the somewhat fewer who "elect" Byzantine Medicine and Pharmacy, both 500-level courses students can take as juniors or seniors or as part of a graduate program. Again, sadness. There is much enthusiasm from these youngsters, and they are the lucky ones. They, or some of them anyway, may be on the forefront of the new revolution now overtaking us in molecular genetics or molecular diagnostics. One chap, for example, in the Byzantine course, is a "gaming expert," with a double major in mathematics and history, so his contribution will be rather different than the "straight" biochemistry majors, of whom I have quite a number. History?

"Why bother" seems to be the general attitude among my colleagues. It would be nice as window-dressing, but with all of these other VERY IMPORTANT subjects to master how can one make room for mere history? Part of the problem lies at the doorstep of the historians (of whatever ilk) themselves. Many "history books" are unreadable, thanks to a kind of in-house jargon that "those

in the know” in the history of science, the history of medicine, and somewhat less the history of pharmacy will understand, but for you who are “merely curious,” go away! Things change. The American historians, followed by the ancient historians of Greece and Rome, were the first to recognize the involution, and the happily noisy controversy over Afro-Centrism is the result of a Classicist or two recognizing what sort of BS “African Studies” departments were offering as history. I find this open, vitriolic quarrel incredibly healthy. Maybe we *can* get rid of Bernal’s *Black Athena* once and for all. Getting *good* history is as difficult as getting good literature: it seems that Sturgeon’s Law has caught up with us: Ted Sturgeon was a prominent science fiction writer of the ’50s and ’60s who posited that 90 percent of science fiction was garbage, thus 90 percent of everything written is garbage. With fewer and fewer students entering the history of science, medicine, and pharmacy, we are witnessing the law of diminishing returns. There is, however, hope: I now have a graduate student who would knock your socks off with his command of Greek, Latin, and increasingly Arabic (not to mention Hebrew) and who has that odd, if not quirky, quality that will produce great scholarship. His interest? Galen. His special interest? Galen’s pharmacology. Nothing much done on this since the Renaissance. Whatever he writes will be original, since he controls the sources, writes clearly and succinctly, and knows what is important and what is not. One student in an area that is (literally) wide open for students who are willing to do the languages, know what science is (and is not), and--perhaps most importantly for the future--how to teach the utterly pragmatic value of History (that cap is intentional) to medical students, or students in whatever branch of the biomedical sciences he or she chances to be in. Galen’s pharmacology was the model adapted, refined, streamlined, and finally with Aetius of Amida’s *Sixteen Books*, became the “drugs by degrees” system of drug classification, used well into the nineteenth century. Now

THAT'S important.

Until pharmacy administrators realize the difference between antiquarianism and historical analysis and research, the future of the history of pharmacy (and medicine) looks rather dim. And with a new revolution about to burst around us in the essentials of drugs and diagnostics in medicine, who can say *any* administrator wanting to keep his job will choose the history of the profession as priority? Yet history gives us hope (cliché--sorry). Once Pasteur, Koch, and the rest set the tone in the nineteenth century, there was a flurry of scholarly activity to probe for antecedents (a quickie introduction into *some* historical problems), and some of the finest works ever written in the history of pharmacy and medicine (mostly in German) emerged by the turn of the century. We may be now at a low point, but I, for one, am not discouraged by the indifference of my colleagues. Sure, I'm window dressing for the time being, but sooner or later somebody, somewhere will say "Well, well: this business of history has a very practical use," much as they used to say at Johns Hopkins medical school; it teaches us to be open to ideas, ideas that can be tested in that laboratory of life.