upon a new level and kind of expert information.[97] Often such innovations took root most readily in institutional settings of health care.

## INSTITUTIONAL PHARMACY

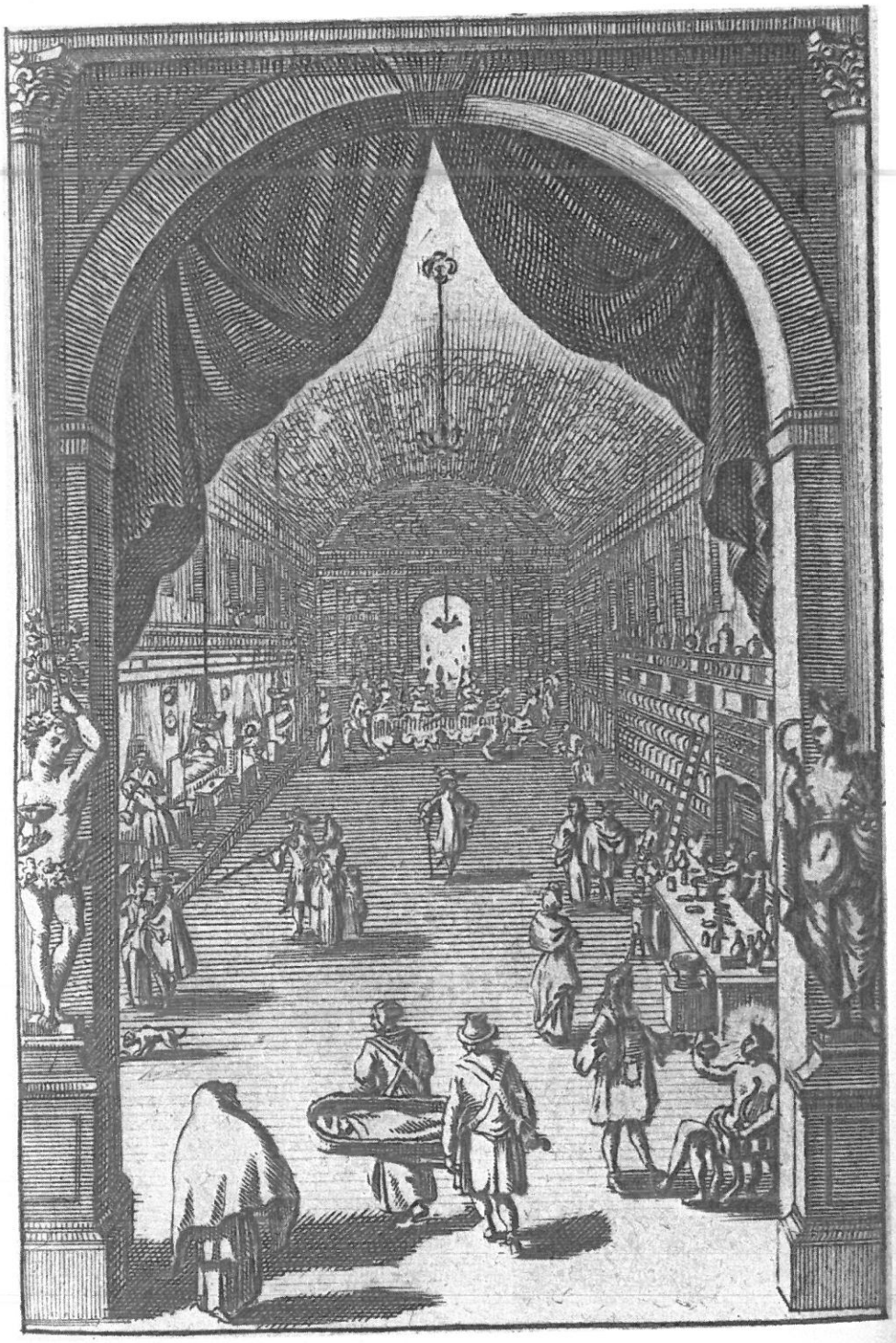
The pre-20th century hospital was all too often a stopover on the way to the burial grounds. It was so, not only for lack of aseptic and curative methods, but also for lack of an attitude making the hospital central for the medical care of its time. So while the hospital is medieval in origin, it came to America still largely as a charitable haven for passive recuperation or dying, especially for those who could not afford proper and costly attendance and medical care at home.

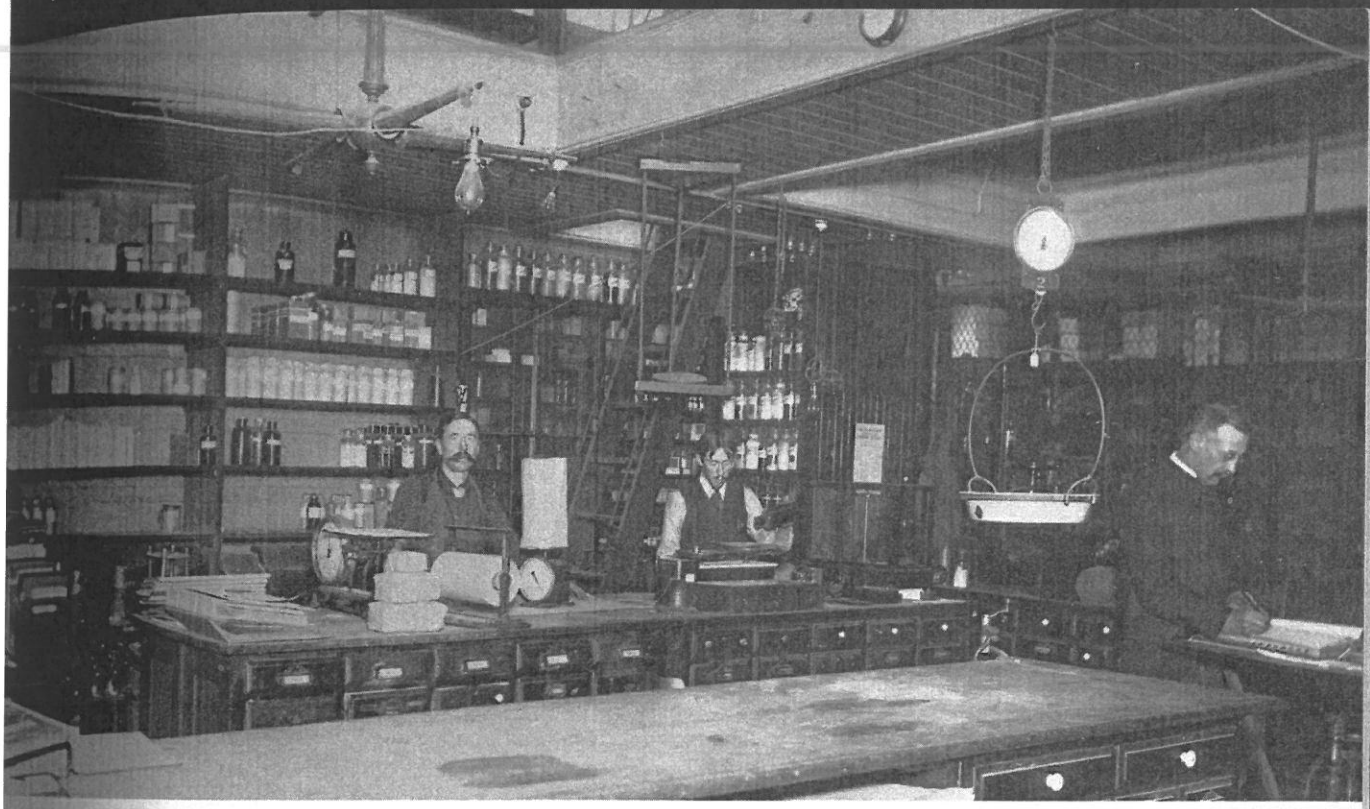
Early American hospitals thus could scarcely have offered either attractive scope or income to the most capable pharmacists for in-house careers. Much remains to be clarified historically about the place of pharmacy in such institutions. It would not be surprising to learn that pharmacy was fused with medicine, as it was in the public shops that we encountered previously on the streets of early American cities—in that hybrid tradition that had come to seem peculiarly British. Before the early 19th century at least, the scattering of hospital "apothecaries" in America as in England probably did "combine pharmaceutical with medical and nursing functions, such as caring for surgical instruments, administering medicines, visiting the sick; and, in the absence of the physician and surgeon, caring for emergencies."[98]

At the first American hospital, opened at Philadelphia in 1751, the attending physicians soon had an assortment of drugs sent over from London, as noted earlier. Having "opened an Apothecary's Shop in the Hospital, and it being found necessary, [they] appointed an Apothecary to attend and make up the Medicines daily, according to the Prescriptions. . . . " When the first apprentice was taken on at the Pennsylvania Hospital "to learn the art, trade and mystery of an apothecary," his indenture made clear that he was obligated not to fornicate, marry or gamble; but this was a standard for any indentured apprentice.[99]

At Old Blockley (which originated in an almshouse and later became part of Philadelphia General Hospital) the apothecary employed in-house, at least between 1788 and 1816, was expected to prepare medications prescribed by attending physicians, but also to "perform certain clinical work," such as "to cup and bleed in the medical ward."[100]

The second institution opened in America, the New-York Hospital, initially authorized an "apothecary," but apparently did not put one on duty until after 1790. His principal domain was an "apothecary's shop" 20 by 16½ feet in size; but he also had certain clinical duties, such as making rounds with the house surgeon, from which he had to "be prepared to report on the state of the patients to the visiting physicians and surgeons" (1804). Six years later this duty of the apothecary disappeared from the hospital's bylaws, becoming the duty of a physician. In 1811, when the hospital published its first formulary, the hospital's regulations set out a





Part of the drug department of Bellevue Hospital, New York City, in the late 19th century, while Charles Rice served there as chemist. One of the most eminent American hospital pharmacists of the century, Rice headed three revisions of the U.S. Pharmacopeia, helped found the National Formulary, and influenced pharmacy by his writing and editing. (From: Pharmaceutical Library, University of Wisconsin, Madison)

rather clear picture of what was expected of such an apothecary, which said in part:

> The Apothecary shall compound and make up all medicines prescribed, agreeably to the formulae from time to time directed by the physicians and surgeons of the hospital. He shall deliver no medicines which are not ordered by the attending physicians or surgeons, and shall permit no medicines to be carried out of the house, except to out-door patients. He shall put up the medicines intended for each ward separately and shall annex to them labels, containing the names of the patients for whom they are respectively prescribed; and, when necessary, directions for taking them. And he shall send them to each ward by the orderly man, to be by him distributed to the patients.[101]

Whatever the qualifications of the pharmacists who staffed these early hospitals, few left a mark in history as did Charles Rice (1841–1901) of Bellevue Hospital in New York City and Martin I. Wilbert (1865–1916) of the German Hospital in Philadelphia; or, in her own way, Susan Hayhurst, Philadelphia graduate of 1883, who served the Women's Hospital as pharmacist for 33 years and was preceptor to many young women who otherwise found it hard to find places for training in pharmacy.[101a] Until after World War I, American hospital pharmacy appears to have remained a quiet tributary of the profession; and indeed many hospitals as then

The hospital setting nurtured professional development of pharmacy in Western Europe, as it had earlier in the Middle East, and would later under American conditions in the 20th century. In this idealized Dutch engraving of 1701, a pharmacy occupies most of the right wall. Beyond the work counter for compounding drugs stretch long rows of containers for bulk medicaments. Along the left wall are curtained cubicles for patients. (From: National Library of Medicine; frontispiece of N. Venette: Venus minsieke Gasthuis, Amsterdam, 1701)

constituted got along without the pharmacist's services altogether.

During the early 20th century hospital pharmacy began to change, to come alive, partly because the hospital system changed. A new model had been set by hospitals following the prototype of the Johns Hopkins Hospital during the last quarter of the 19th century; the American Hospital Association began to make its influence felt after its founding in 1899. After the turn of the century the American Medical Association took up the cause of hospital reforms, and thrust beyond them to a new concept: that hospitals should be carefully organized for the best service of the patients, the training of personnel, and the progress of medicine.[102] The journal *Modern Hospital* became a vigorous exponent of the new American hospital—inspired by its social role, based on the cure and prevention of disease in every citizen, and supporting and being supported by burgeoning specialization. By the first World War, Lendefeld concludes, the foundation had been built and accepted, to be implemented in the postwar years.

The structure of this new hospital system—with its emphasis upon specialties, efficient management, and therapeutic effectiveness—created opportunities for hospital pharmacists of a different type as well as number. American pharmacy soon sensed the spirit of change. By the early 1920's hospital pharmacists became more visible in the journals of American pharmacy; pharmacist E. C. Austin of the Cincinnati General Hospital observed "that there has arisen a greater demand for hospital pharmacists" (1921) and good ones were scarce; the President of the A.Ph.A. spoke of "the exacting and responsible nature of their service, together with the fact that it is so largely along professional lines . . . ;" hospital pharmacists became active contributors to the A.Ph.A.'s Section on Practical Pharmacy and Dispensing, but it would be 1936 before a specific Subsection on Hospital Pharmacy organized. A number of state groups of hospital pharmacists also organized in the 1930's, for which the only precedent apparently was the Hospital Pharmacy Association of Southern California (f. 1925).

In 1932 Edward Spease, dean of pharmacy at Western Reserve University, foresaw a time "when hospitals will demand pharmacists trained in hospital pharmacy." Alex Berman has pointed out Spease's pioneer role in fostering special education and internships for institutional practice, and in working with M. T. MacEachern of the American College of Surgeons in developing minimum standards for hospital pharmacies accepted by the College in 1936, which met analogous response in the American Hospital Association.[103]

The American Society of Hospital Pharmacists emerged as an independent organization in 1942 (see p. 208)—then A.Ph.A.-affiliated but supplanting the Subsection—and signalled new stature and goals for this specialty. What could scarcely be foreseen was the transformation that would occur within a quarter century to bring the hospital pharmacist out of his basement "drug room" and into an unprecedented professional enthusiasm and stature in the history of American pharmacy. This trend gathered strength not only from farsighted leaders of the caliber of H. A. K. Whitney, Donald E. Francke, and others, but also from the expansion of facilities across the country made possible by the Hill-Burton Act, and the impact of voluntary and compulsory health insurance plans. Not the least factors in this trend were the environment and expectations to which many hospital pharmacists responded as the mainstream of medical care gradually shifted from private medical offices and pharmacy shops into structured, integrated, well organized work settings. These were not only hospitals, but clinics, group practices and extended-care facilities. Since the 1940's particularly it has offered American pharmacists an opportunity to return "to the basic purpose for the existence of pharmacy as their primary objective." Looking back from the

early 1960's, the Audit of Pharmaceuticical Service in Hospitals expressed this purpose as essentially "to provide pharmaceutical services as an integral part of the total patient care concept in the interest, safety, and welfare of the public health . . . the only basis for the existence of pharmacy as a profession. It is because of this prime motivating force," the Audit suggested, "that we have realized tremendous progress in hospital pharmacy during the past two decades."[104]

Since 1957, the pharmacy has been included among the essential services of the hospital by the Joint Commission on Accreditation of Hospitals, and, indeed, has been described as "the most extensively used of the therapeutic facilities of the hospital."[105]

Moreover, the hospital pharmacist had moved by the 1960's into a position of considerable autonomy of professional planning and action, reflected in the respect accorded him by hospital administrators, which contrasts with his status before the 1930's.[106] The pharmacy had evolved from a storage room for medical materiel into, commonly, the focal point for all activities related to drugs, except their prescribing and administration to patients. By the 1970's even these latter two activities were becoming linked to pharmaceutical services, as "clinical pharmacists" trained to an advanced level moved out from the pharmacy itself onto the wards in close contact with other professional personnel and the patients themselves—especially in teaching hospitals where new role models and modified methods for medical care at large were being tested.

Although great progress had been made within a few decades in services, in physicial facilities and, not least, in *esprit de corps*, the Audit had shown concretely how wide the disparities, how great the range of pharmacy resources, even within hospitals of a given bed capacity.

In 1957 an estimated 5833 pharmacists were practicing in American hospitals (including 988 part-time). Of the hospitals having less than 100 beds only about 14 per cent had the services of a pharmacist, and during the ensuing years a trend developed for smaller institutions (nursing homes as well as hospitals) to have satellite pharmacies serviced either from a larger hospital or from a community pharmacy. A secondary role for the pharmacist as purchasing agent or as supervisor of central sterile supply in the hospital has made a full-time position for a pharmacist feasible in many small institutions.

About four hospital pharmacies in 10 of the early 1960's were still undertaking manufacturing or bulk compounding while it had disappeared completely from community pharmacies, and about the same proportion were preparing at least some of their sterile solutions for topical use.[107] This persistence of the traditional drug-making function has been related to institutional scale, a greater tendency in the institutional setting for physicians sometimes to utilize forms of medication not commercially available, and ths increasing availability of auxiliary personnel on pharmacy staffs in recent decades. The structure of institutional services since about midcentury has increasingly included pharmaceutical and therapeutic consulting services, which involves most hospital pharmacists, but to different degrees (mostly unquantified, although the trend seems clear). Such interactions with other healthcare personnel often are much modified by the amount of printed information flowing from the pharmacy into nursing and clinic units as well as by the amount of "detailing" by manufacturers' representatives, which "has increased enormously during recent years as the percentage of the ethical drug market in hospitals has continued to rise . . . ," the Audit reported. By 1970 about four-tenths of all prescriptions dispensed in the United States were dispensed through hospital pharmacies, which numbered about one-tenth of all pharmacies.[108]

The dollar volume of hospital drug purchases from commercial laboratories had

more than tripled between 1961 and 1973, but as a proportion of the total prescription-drug market in the United States, one study suggested, hospital usage remained during this period in the range of 22 to 25 per cent of the total.[109]

A balance wheel in the mechanism for pharmaceutical service in hospitals was the pervasive adoption of a formulary system, administered by a pharmacy and therapeutics committee. Several of the early pharmaceutical publications in America may properly be considered hospital formularies (see pp. 169 and 258); but only since the 1930's has the modern concept been widely applied. This hinged on a formal liaison between the hospital pharmacist and the medical staff. After the concept of a pharmacy committee (with a pharmacist as permanent secretary) became embedded in the Minimum Standard for Hospital Pharmacies of the American College of Surgeons (largely attributable to Edward Spease and Robert Porter of Cleveland), the systematic evaluation and selection of the medicinal agents and established policies of drug control and use within a particular hospital became more common. These policies were to be communicated and to become effective largely through the mechanism of a hospital formulary.

Substituting the group judgment of staff physicians and pharmacists, to some extent, for the free exercise of prescribing by the individual staff physician and for the free play of commercial selling techniques by drug manufacturers, the formulary system became periodically controversial both locally and nationally. A particular irritant to manufacturers during the 1950's and later was the concept by which a staff physician gave the hospital pharmacist "prior consent" to select the brand of a drug product to be dispensed, within the guidelines of the hospital's formulary. This culminated in a multi-society effort to ease the friction by generating "A Statement of Guiding Principles on the Operation of the Hospital Formulary System" (first version, 1960).[110]

Such activities perforce gave the most progressive hospital pharmacists a clinical orientation before clinical pharmacy emerged as a distinctive concept and program in academic pharmaceutical education. H. A. K. Whitney at the University of Michigan Hospital and Donald A. Clarke at the New York Hospital were on the cutting edge of this development, which was formalized after the late 1940's by the first graduate programs offering a Master's degree combined with a hospital residency.

The hospital as an interdisciplinary education center for the average student of pharmacy, however, did not become firmly linked to most schools until after the 1960's, with the help of federal funding of clinical faculties. From that base, institutional pharmacy moved off purposefully in a new direction.[111]

## WHOLESALE ESTABLISHMENTS

There is some doubt whether European professional pharmacies evolved from the early general store or from the pharmaceutical work done by monks in the monasteries. Probably both conjectures are true. However, there is no doubt that in continental Europe dispensing pharmacy existed before the specialized wholesale drug trade came into being. The North American continent offers the paradox that here the wholesale drug trade came first.

Like most paradoxes, this one surprises only when first presented. In Europe, with its comparatively early separation of medicine and pharmacy, the pharmacists from the 13th century on met the medicinal needs of the population. They were collectors of crude drugs and, on a small scale, manufacturers, buying limited amounts of imported drugs. It was not until the 17th century that the use of imported drugs had grown to a considerable extent, and not until the late