

A CENTURY OF MEDICAL PROGRESS IN PHILADELPHIA: 1750 - 1850

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MEDICAL history of one sort or another has received increasing attention of late years in this country. A whole series of popular works has exploited the story of a profession which deals with matters so vital to us all, with life and with death. There have been books about the country doctor, the frontier doctor, the dog-team doctor, doctors on horse-back, the doctor's Odyssey, and so on. The vogue has also invaded the "movies," and a ghostly procession with such titles as "Men in White," "The White Angel," and "The White Parade," have issued from Hollywood along with the adventures of one "Dr. Kildare" and similar productions. There has also been a marked increase of interest in the more serious history of medicine, as witnessed by the growth of the American Association of Medical History since its reorganization several years ago. This interest has been partly native, partly foreign in origin.¹ Several of the popular productions moreover, have attained a high historical level, notably the writings of Hans Zinsser and of Paul de Kruif, and the moving picture "The Magic Bullet," which dealt with the career of the German chemo-therapist, Dr. Paul Erlich.

In its broadest implications, medical history is not—as many are likely to assume—simply a minor subdivision of the past, of concern primarily to a few specialists. Viewed from a sociological angle, medical history is rather a fundamental aspect of social development, paralleling and of almost equal significance with, let us say, economic history. For just as men must maintain life by

¹Recent and contemporary British and German medical historians have exerted a marked influence on this country, notably such leaders as Charles Singer and Sir D'Arcy Power of London, Karl Sudhof and Henry E. Sigerist of Leipzig, and Paul Diepgen of Berlin. Sigerist subsequently became Director of the Institute at The Johns Hopkins and has been largely responsible for the reorganization of the Association above noted. Among Italian medical historians, Aurturo Castiglioni—formerly at Padua and now at Yale—has been the most influential in this country.

a constant effort to secure food, clothing, housing and other necessities which are the ultimate objectives of economic activity, so must they—having attained these values—preserve life by an equally constant struggle against disease. If this seems an exaggerated comparison, simply recall how often disease was a more serious menace to American colonists than was any actual lack of food or clothing.

So broad indeed is the true scope of medical history that it might be employed as an approach to the general history of any people, just as can economic or political approaches. Consider, for instance, the Philadelphia story. This is selected because the city has always been a major medical center, but it should be added that a somewhat similar story could be told in terms of other large American towns.² In tracing it, one must first consider the geographical factor—just as would be done for economic history. In this case, it is the geographical basis of disease which demands attention. The climate of Philadelphia, for example, was sufficiently cold to encourage various respiratory diseases in winter, and sufficiently warm to foster typhoid and malaria in summer. But it was not warm enough—long enough—to facilitate the more serious fungus infections; or to enable the yellow fever mosquito to survive from one season to the next. Nor was it warm enough to dispense over long periods with shoes, hence—in part—the freedom of the region from hook-worm infection. These are but a few illustrations of climatic influences, but they will serve the immediate purpose.

After considering the geographical background, a medical historian must pass to the racial and cultural history of his people. Being Europeans by race, the English settlers of Philadelphia brought with them their own more or less domesticated diseases; that is, the infections to which they had long been exposed and to which it is possible they had developed some degree of racial immunity. Tuberculosis and measles are good illustrations. It was fortunate for the pioneers that leprosy had largely disappeared

² The medical history of a number of other Pennsylvania cities, notably of Pittsburgh, deserves more attention than it has received. Pittsburgh surgery, e.g., has been notable for the work of Albert G. Walter (1811-1876), and for the brilliant early career of Chevalier Jackson a half century later. See the latter's *Autobiography* (Philadelphia, 1938); and Theodore Diller, *Pioneer Medicine in Western Pennsylvania* (New York, 1927).

from England before their time, else their subsequent history might have been a very different one. Just how or why they also escaped the plague, rampant in London during the seventeenth century, is not easy to explain. Their ordinary terrors, in the Philadelphia of that and the succeeding century, were the so-called fevers.³ These they designated, after the picturesque manner of the day, with such names as "the Barbados distemper," "the Dutch fever," the bilious fever, the putrid fever and so on. Subsequently they spoke of the "yellow" fever, and there was occasionally the small pox—to say nothing of the great pox. Several of these were epidemic infections. Early Philadelphians were, of course, also subject to most of the endemic ills that flesh is heir to; but such were the vague notions about disease identities prior to 1800 or even 1850, that no very clear picture of these disorders is available from the confused accounts of fevers, fluxes, dropsies, and inflammations that come down to us.

The cultural heritage of the settlers, as well as the mode of life necessary in a new country, played their rôles in disease history. Since bathing had become a lost art in Europe from about 1500 on—partly because of fear of the great pox—personal cleanliness was pretty much an unknown quantity, hence the recurrent typhus, designated as "ship fever," "jail fever," and so on. In the earliest period, the generally rural manner of living, with its implications as to fresh air and exercise, favored the health of the community; but as Philadelphia grew, the usual dangers of urban life increased in proportion. By the middle of the nineteenth century, the population had reached several hundred thousand; and, like other large American cities, its slums exhibited some of the worst examples of overcrowding and generally unsanitary surroundings to be observed in the western world.⁴

The actual history of the endemic diseases has never been traced, and awaits an analysis of the early bills of mortality by someone able to interpret the confused nosography (that is, the names and

³ An early account of disease history is provided in Benjamin Rush, "An Inquiry into the Comparative States of Medicine in Philadelphia between the years 1760 and 1766, and 1805," *Medical Inquiries and Observations*, 2nd ed., IV (Philadelphia, 1805), 370 ff. See also Carl Bridenbaugh, *Cities in the Wilderness* (New York, 1938), pp. 85 ff.

⁴ See the discussion of urban slum conditions in large American cities in the *Transactions* of the American Medical Association, II (1849), 520, and X (1857), 93-99.

classifications) of the period. Certain very general trends can be noted; for example, it was reported that mental disease was increasing towards the end of the eighteenth century. Pulmonary tuberculosis reached a very high rate early in the next century, and probably had been increasing during the preceding generations. Malaria, on the other hand, was declining by the end of our period. All of these changes can be plausibly correlated with the growth of the city.

The epidemic diseases, on the other hand, have always received considerable attention because of their spectacular character. The most terrifying of these, in Philadelphia, was undoubtedly yellow-fever, which culminated in the devastating epidemics of the years 1793 to 1805. The great epidemic of the former year was, with the exception of one outbreak in New Orleans, probably the worst ever suffered by an American city. During a three-month's interval, the burials—chiefly caused by this one disease—amounted to more than ten per cent of the total population. If one will imagine what it would have meant to Philadelphia, had two hundred thousand people died there from one disease last summer, some idea can be secured of the scale of this appalling tragedy.⁵ After 1805, there were no serious yellow fever epidemics; and while cholera came in the thirties, this and subsequent visitations of that disease were not so serious as the "yellow jack." Smallpox appeared sporadically throughout the nineteenth century, but was never as much feared after the introduction of vaccination in 1800. Typhoid fever, on the other hand, became an increasing menace after that date.

The end results of the disease situation may be viewed in terms of mortality rates. The gross mortality rate of large American cities tended to rise during the first half of the nineteenth century. Philadelphia was unusual in that its death rate declined slightly after 1825; but it rose again after 1850 and remained relatively high throughout this era. Endemic diseases, rather than the spectacular epidemics, were primarily responsible, though the latter were significant in that they aroused more alarm than did the really more dangerous disorders. Whether there had been any decline in gross

⁵ The classic accounts are the essays by Matthew Carey and by Benjamin Rush. A considerable literature on this epidemic has developed. For an interesting brief account see Mulford Stough, "The Yellow Fever in Philadelphia, 1793," *Pennsylvania History*, VI (1939), 6 ff.

mortality during the eighteenth century, has not been checked. There was a very marked fall in infant mortality in England between 1750 and 1800, and Philadelphia followed in so many ways the general pattern of English urban life, that there may have been a similar improvement in its situation. Rush claimed, for example, that there was a sharp drop in maternal mortality between 1760 and 1800. Be that as it may, it seems probable that the gross mortality rate of Philadelphia, like that of other large American cities, was higher by the middle of the nineteenth century than it had been during most of the preceding century.⁶

This may seem strange in view of the whole progress of science, including medical science, which had been under way since Franklin first flew his kite; and the apparent paradox calls for some consideration of the whole matter of the social control of public health. How had the citizens of Philadelphia sought, during all these years, to defend themselves against the menace of disease?

The most obvious element in social control was the science and practice of medicine.⁷ A large part of routine practice in minor matters was doubtless on a folk level in 1750, with old-wives' remedies, "kitchen physick," and downright magic and superstition playing their usual rôles. One branch of practice now viewed as a major specialty, obstetrics, was still on a folk level in Philadelphia until Shippen gave his first lectures about 1760; but the services of mid-wives were rapidly abandoned by the middle and upper classes thereafter.⁸ The care of infants was also left to "old grandmothers" throughout the eighteenth century. Small

⁶ F. L. Hoffman, "American Mortality Progress During the Last Half Century," in M. P. Ravenel (ed.), *A Half Century of Public Health* (New York, 1921), pp. 103, 104. See also *Transactions of the American Medical Association*, cited in note 4 above; and the *Proceedings of the Third National Quarantine and Sanitary Convention* (Boston, 1859).

⁷ There are, to be sure, other elements; e.g. the development of state "medical police" with reference to medical education and licensing, medical research, preventive and "socialized" practice, control of food and drugs, etc. Running through all these matters is the influence of the state and at times of the church, as well as that of the medical profession. But only the more obvious phases of medical science and practice can be considered in this paper.

⁸ By 1825, only ten midwives were listed in the city directory, as compared with about seventy doctors, eighteen dentists, and seventy-eight nurses, Frederick P. Henry (ed.), *Standard History of the Medical Profession in Philadelphia* (Chicago, 1897), p. 149. (The typescript preface to the copies of this work in the libraries of the Philadelphia College of Physicians and of the University of Pennsylvania, states that it was largely the work of Burton A. Konkle.)

wonder that both the maternal and infant mortality rates were high.

Meanwhile, quackery which so often seems a constant factor in medical history, was actually becoming an increasing threat to the public pocket-book—if not to the public health. The eighteenth century witnessed the first commercialization of quackery in terms of “patent medicines,” an unfortunate development made possible by the advent of the patent law and by the exploitation of early newspapers as advertising media.⁹ An increasing quantity of such remedies as “Turlington’s balsam of life,” “Daffy’s elixir,” and “Baron Van Swieten’s worm plumbs” was apparently sold in the Quaker City during the later eighteenth century, and the “ads” proclaiming their wonders have at least the merit of suggesting “what ailed” the populace in that period. Most of the earlier patent remedies were English products, and now and then a picturesque charlatan—the really glorified quack—would come over from London to exploit the credulity of the colonials.¹⁰ Here was a less happy aspect of “the transit of culture” than those usually suggested by that phrase.

It is, of course, the story of regular medicine that is of prime significance, and here the Philadelphia of 1750-1850 played a conspicuous part in national developments. The majority of physicians in the city of 1750 had been trained through an apprenticeship, but a few more fortunate had studied in Leyden or other European centers. After the middle of the century, Edinburgh attracted most of the students able to go abroad, so that Scottish medicine superseded Dutch as the prevailing influence on American science. Edinburgh was in turn replaced by London, after the Revolution, as the chief training center for American medical students; and English influences thereupon became predominant.¹¹ Between about 1825 and 1850 there was a period when French contacts were a major factor in American medicine; and finally, after the latter year, students from this country were

⁹ R. H. Shryock, “Cults and Quackery in American Medical History,” *Proceedings of the Middle States Association of History and Social Science Teachers*, XXXVII (New York, 1939), 19 ff.

¹⁰ Nathan Goodman, *Benjamin Rush: Physician and Citizen, 1746-1813* (Philadelphia, 1934), pp. 26 ff.

¹¹ See Francis Packard, *History of Medicine in the United States*, I (New York, 1931), 273 ff.; and also the same author’s “How London and Edinburgh Influenced Medicine in Philadelphia,” *Transactions of the College of Physicians of Philadelphia*, III (1931), 151 ff.

destined to complete their education in Berlin, Munich, and Vienna. Philadelphia, as the chief training center in the United States, reflected all these changes very closely.

Here a word as to the science and practice of these several periods is necessary. The average person is apt to assume that medicine was "backward" in earlier days because this or that discovery had not yet been made—as if progress in science depended simply on piling one fact on top of another. This holds well enough for folk medicine, but not for a rational discipline. In the latter, method and point of view are more essential; and in these fundamental respects Philadelphia medical science—like all American medicine—made little progress during the eighteenth century. Indeed, in some ways, it seemed to move backwards.

In order to understand this, one must first recall that the basic medical science is pathology. For medicine is concerned primarily with disease, and all ideas as to either the causes or the cures of illness must be predicated on what happens in the sick body. Unfortunately, neither the Dutch masters to whom Philadelphians resorted before 1750, nor the Scottish who instructed them thereafter, had any adequate knowledge in this field. They viewed disease processes as simple, subjective conditions to be differentiated only in relation to the parts affected—as illness of the head, of the chest, and so on; or, more frequently, as illness permeating either (1) the solid or (2) the fluid parts of the body. These last two theories were usually conceived in mutually exclusive terms. Those who accepted a fluid or "humoral" pathology talked vaguely of vapors and impurities and therefore followed a therapeutics of depletion: of ridding the body of the supposedly impure humors through varying degrees of bleeding, sweating, purging, and salivation. This was—in rather moderate form—the procedure of the Dutch master, Boerhaave, which Benjamin Rush found in vogue in Philadelphia when he returned there from Edinburgh in 1769.¹²

Rush had acquired in Scotland, however, the other traditional pathological theory; namely, that disease was due to tenseness or laxity of the solid part—especially of the bloodvessels and nerves. Another Edinburgh student, a Scotsman named John Brown, proclaimed about 1790 that as all illness was due to such tenseness or

¹² See note 3 above.

laxity, it could all be cured by the use of soporifics (for tension) or of stimulants (for relaxation): by laudanum or by Scotch whiskey. Here was true logical simplicity: doctors need search hereafter for only two causes and employ but two corresponding remedies. This philosophy, moreover, exerted a personal fascination which proved irresistible in some circles. All over Europe, people began "to go in" for laudanum and Scotch!

The great revolution in medical theory which Rush subsequently announced—his patriotic "American system"—largely consisted of reducing Brown's two causes to one. All diseases, Rush declared, were due to "excessive action" (tension) in the blood vessels, and all were to be cured by a relaxing procedure. Curiously enough, he did not follow Brown in using opium for this purpose, but resorted instead to bleeding. Rush, to be sure, did not bleed to eliminate impurities as did the humoralists, but rather to attain relaxation. One can only hope that this distinction proved comforting to the patients. The soundness of Rush's theory seems to have been demonstrated by the fact that, if he bled long enough, his patients always did relax sooner or later. To make sure of this end, he recommended that when necessary bleeding be carried to the point of removing four-fifths of all the blood in the body.¹³ He then threw in violent purging for good measure. Unlike his predecessors in the city, he had small confidence in the healing powers of Nature, and so tended to carry all these remedies to extremes. Such was the practice which "the American Sydenham" introduced throughout the central and southern portions of the Union after 1800.

As long as all the phenomena of illness were thought of in such simple, undifferentiated terms, even good methods of research were of small value. Eighteenth century medicine had inherited from the preceding era, a knowledge of such essential modern methods as the use of instruments of observation, of quantitative procedures, and of experimentation; but these were rarely employed by American medical men prior to the Civil War.

Research was really unnecessary, if the nature and cure of all illness was already known in terms of some theoretical "system" of pathology. Looking back, we can now see that physicians

¹³ Benjamin Rush, "In Defence of Blood Letting," *Medical Inquiries*, 2nd ed., IV, 335.

were misled here not simply by the complexity of disease phenomena, but also by the pressure of humane interests and public demand. Physical scientists could take their time in investigations, but doctors must get results quickly. The sick and dying could not wait. The question of cures, we now know, was really too obscure to permit of quick results through even the best research methods; and physicians therefore ignored research and chose rather to follow speculative short-cuts which brought the appearance of solutions. After all, no matter what theory was applied, many patients did recover, and the practitioner could always credit this to his treatments. It took a long time to realize how inconclusive such purely clinical evidence, unchecked by statistics or experiment, might really be.

That this speculative medicine was still dominant in some of the best schools of 1800—including those of Edinburgh and of Philadelphia—was also due to other factors beside the natural demand for cures. There was, to begin with, the apparent failure of other approaches to the problems of pathology. During the seventeenth century a number of medical leaders, notably the Englishman Sydenham, had indeed rejected the traditional view that all sickness was due to one or two simple, general conditions; and held that illness should rather be broken down, as it were, into various specific diseases. We are now so accustomed to this idea that it is hard to realize that most physicians, as late as 1800, rarely employed such concepts. Sydenham had considered not only the sick patient whose body was out of order, but also the disease entity—distinct from the body—which he had seen in former patients and expected to see in others in the future. If one could only identify and classify these distinct diseases, one could then seek for specific causes and cures for the same. The idea was not entirely new. Certain disorders with striking superficial symptoms like measles and smallpox were vaguely recognized in classical times, and clearly distinguished during the Middle Ages. Nevertheless, Sydenham emphasized the concept of distinct entities and the view took hold.¹⁴

¹⁴ See Knud Faber, *Nosography* (2nd ed., New York, 1930), Chap. 1; Henry E. Sigerist, *The Great Doctors* (New York, 1933), pp. 175 ff. Pertinent selections, both from Sydenham and from the medieval Rhazes (c. 900 A. D.) relating to early disease identification, have recently been published in *Medical Classics*, IV (Baltimore, 1939), 29 ff., 306 ff.

Unfortunately, the only basis upon which diseases could then be distinguished was that of symptoms, and symptoms were so numerous as to be endlessly misleading. By the later eighteenth century, the published nosographies—following Sydenham's lead—listed as many as eighteen or nineteen hundred supposedly separate diseases identified with as many symptoms or symptom-complexes. One suspects that the nosographers yielded to the lure of classification as such, which was characteristic of the age. The process worked well enough in botany where one dealt with tangible species, but was another matter when one played on paper with the names of human symptoms. It was in part a protest against the resulting confusion which led impetuous men like Brown of Edinburgh, and Rush of Philadelphia, to go to the other extreme with their doctrines of only one or two basic conditions of illness.

The more level-headed doctors who tried to follow Sydenham in distinguishing between one disease and another, tended in practice to avoid the over-complicated and impractical nosographies. They did not go to the other extreme of a monistic pathology like that of Rush, but they did have to think in terms of a few over-simplified "clinical pictures" like "dropsy," "inflammation of the lungs," "fevers," and so on. These concepts were not clear-cut enough to encourage a search for specific causes or cures. Even when a treatment which we now know to be specific was discovered more or less accidentally in folk medicine—as in the case of cinchona—its effectiveness was limited by the confusion of "fevers" to which it was applied. We now know it helped with malaria but was useless with other infections not then identified. Conversely, it will be recalled that the one disease to which the preventive practices of inoculation and vaccination were successfully applied during the eighteenth century, smallpox, was one of the few conditions then clearly identified.

In retrospect, then, one may say that the grand medical problem of that age was to follow Sydenham's lead in identifying diseases through symptoms, but to refine it in such a way that the entities defined be neither too generalized like those just noted, nor too detailed like those of the nosographies. This problem was solved by a remarkable group of research leaders, who found a clue in the combination of two research trends which had hitherto fol-

lowed more or less independent paths. This was the correlation of clinical descriptions with pathological anatomy—of the bedside findings with those of the autopsy. For centuries anatomists had pursued their own way, often out of pure curiosity, and had gradually acquired some knowledge of pathological conditions. At the same time, both they and the clinicians slowly attained the view that there might be some connection between the ante-mortem behavior of the sick body and the post-mortem conditions which it exhibited.

This view was first effectively expressed in the classic work of the Italian Morgagni, published at Padua in 1761; and his lead was later followed by groups of brilliant pathologists in London, Dublin, and Paris. The French leaders, from Bichat to Laennec and Louis—from approximately 1790 to 1840—patiently followed hundreds of cases through hospital wards to the death house, and systematically checked symptoms against lesions, until a new picture of disease entities began to emerge.¹⁵ It may be noted, in passing, that such investigations would not have been possible except in large hospitals, and that the development of these institutions between 1750 and 1850—itself a function of the growth of great cities—was therefore as essential a condition to the evolution of modern medicine as was any particular method or approach. This dependence of modern medicine upon “the culture of cities” well illustrates the intimate association of social with technical factors in bringing about the scientific developments of recent centuries. Astronomy could be, indeed had to be, pursued in rural retreats; medicine required just the opposite setting.

As a result of such research as was done at Paris, the older humoral pathology was frequently found to be meaningless. Diseases were often clearly associated with lesions in organs or within the tissues of the same. Moreover, the less extreme but still too generalized pictures, like “fevers” or “inflammations,” could be differentiated as hiding a number of more definite conditions corresponding to specific lesions. The “clinical picture” of “inflammation of the lungs,” for example, was shown at times to correlate with the existence of distinct tubercles in the lungs,

¹⁵ See Esmond R. Long, *History of Pathology* (Baltimore, 1928), pp. 4, ff. Interesting selections from Morgagni have recently been published in *Medical Classics*, IV (March, 1940), 640 ff.

at other times with a congestion or consolidation in the lung tissue, again with a congestion in the bronchii, or in the pleura, and so on. In a word, there emerged distinct pictures of such diseases as pulmonary tuberculosis, pneumonia, bronchitis, and pleurisy. These concepts gave the medical scientist something he could really work with in seeking causes or cures.

All this may seem a far cry from the medical history of Philadelphia, but the story of no one center can be understood save in terms of the world trends. Unfortunately, the revolutionary changes in pathological science which had begun at Padua as early as 1750, and were carried forward so rapidly in London and Paris after 1820, seem at first to have been largely unknown to Philadelphia practitioners or to those of other American towns.¹⁶ They owed their professional inspiration to Edinburgh and London, but do not seem to have followed closely the research activities which were so notable in the latter center after 1820. British influence did make for the institutional progress in Philadelphia of which we have all heard so much—of the development, for example, of the University of Pennsylvania Medical School after 1760 by Morgan, Shippen, and Rush, on the model of Edinburgh. And of the establishment of the Philadelphia College of Physicians, after the manner of the London College, some years later. These were sound professional foundations and paved the way for real service by the guild, once its scientific knowledge was made more effective. But institutional progress, meanwhile, was not the same thing as scientific progress; and not until the Americans finally realized what was going on in European centers, would their science rise above the speculative level which Rush had revived and perpetuated. This intellectual about-face did not occur until another generation had passed.

Before considering the advent of truly modern medicine in Philadelphia, after about 1830, it will be well to glance briefly at special aspects of practice outside the ordinary treatment of illness. There were, for example, the auxiliary services of nursing, phar-

¹⁶ Nathan Goodman, in his thorough and detailed *Benjamin Rush*, observes (p. 229) that American physicians "watched with no little interest" the work of Morgagni and Bichat; but this generalization would seem to call for further investigation. Cf. Edward B. Krumbhaar, "The History of Pathology at the Philadelphia General Hospital," *Medical Life* (April, 1933), pp. 162 ff.

macy, veterinary medicine, surgery, and dentistry—each of which has, to some extent, its own professional and its own scientific history. Nursing, as we know, was not viewed as a profession in the era under consideration. Rush recommended work on veterinary medicine, but there is little to be said on this score prior to 1850. Both pharmacy and surgery were viewed in Britain as separate guilds from the physicians; but in Philadelphia, as elsewhere in America, the simplicity of the times led most physicians to combine the functions of physician, pharmacist and surgeon. In the latter part of the eighteenth century, a number of apothecaries' shops were opened in the city, and these followed in practice the London pharmacopeia—a standard throughout the British Empire. Busy town practitioners found it convenient to transfer prescription-making to these shops, and so the distinction between the two professions reappeared before 1800. When the University's medical faculty proposed, in 1821, to improve the standards in the drug trade by granting an M.A. in pharmacy, the city's druggists forestalled them by founding the Philadelphia College of Pharmacy for the same purpose.¹⁷ Thereafter, the two professions remained distinct.

Surgery, on the other hand, was never revived here as a distinct guild. The only exception to this was in the case of dental surgery, in which field specialists appeared in Philadelphia shortly after the Revolution. Closely connected with anatomy, the general practice of surgery made real technical progress in London in the days of the Hunters; and Dr. Physick and other Philadelphia physicians who gave especial attention to surgery, were well trained in the English metropolis during the later eighteenth century. Like other Americans, they were supposed to have a special knack for anything involving manual dexterity and skill. But surgery necessarily remained a sort of side-line dealing with such emergencies as aneurysms, fractures and amputations, or occasional superficial operations, as long as the speculative pathologies held sway. The occasional major operations were only the exceptions that proved this rule. It is so easily overlooked that one could not, in the nature of the case, operate on the blood or other humors. Hence, as long as disease was supposed to lie in these humors—

¹⁷ J. T. Scharf and T. Wescott, *History of Philadelphia*, II (Philadelphia, 1884), 1659 f.

or in mysterious tensions of the whole body—there was really nothing to operate upon in ordinary illnesses. Only when the anatomical view of a pathology of organs and tissues came in, after 1830, would surgery move into the very center of therapeutic procedures. And only then would men search earnestly for such technical improvements as the use of antiseptic or anesthetic procedures. These last may therefore be viewed as the first fruits rather than as the causes of the new surgery.¹⁸

Even less encouraging than the surgery of 1800, was the manner in which Philadelphia practitioners dealt with that peculiar disease problem presented by epidemic disorders. This is a distinct matter, because it involves the question of the public health as distinct from that of individuals. Eighteenth century doctors had inherited two views about the causes of epidemics in communities, each quite distinct from the doctrines already noted about the causes of illness in individuals. The former were theories of transmission rather than of origins. The first of these epidemic doctrines was the medieval view that such diseases were spread by contagion from man to man, from animals to man, or from inanimate objects to men. If this view were sound, such remedies as quarantine, isolation, notification, and fumigation were clearly indicated. Philadelphia, following this philosophy, had long provided port doctors, quarantines, and a "pest house" for small-pox victims.

But as the eighteenth century advanced and the memory of medieval plagues receded, there was a revival of the classical tradition that epidemics were spread rather by noxious airs and waters, and that sanitary reform was the real remedy. Philadelphia was a mercantile center, and merchants encouraged the latter view in order to get rid of the losses due to vexatious quarantines. When the yellow fever struck again in 1793, there ensued a violent quarrel between those physicians who held to the medieval theory with its quarantines, and those who, like Rush, blamed the epidemics on a local origin in terms of decaying coffee and the consequent pollution of the atmosphere.¹⁹ This

¹⁸ See Henry E. Sigerist, "Surgery at the Time of the Introduction of Antisepsis," *Journal Missouri State Medical Association*, May, 1935, pp. 169 ff.

¹⁹ Nathan Goodman, *Benjamin Rush*, pp. 170 ff.

quarrel concerning imported contagion *versus* local miasms was destined to continue clear down to 1900, when the discovery of the rôle of the yellow fever mosquito showed both theories to have been partly right and both partly wrong—hence the endless debates and confusion. Meanwhile, the classicists exercised enough influence to persuade the city of Philadelphia, after 1800, to undertake the first serious American effort at sanitary reform. A permanent Board of Health was established, streets were gradually paved and cleaned, and the first large public water pumping system was completed in 1802. While theoretically sound, this system eventually made the health situation worse by pumping Schuylkill water—laden at times with the germs of cholera or of typhoid—throughout the city.

As the sanitary reform movement gained ground between 1800 and 1850 throughout the nation, the Philadelphia Board of Health played a leading part. One of its directors, Dr. Wilson Jewell, persuaded the Board to convene the first “national sanitary convention,” which met at Philadelphia in 1857. This and subsequent conventions formed, in effect, the first American public health association. The organization was inspired by contemporary British reform, and was also stimulated by the growing scandal of slum conditions in all of the larger towns. Had it not been for the Civil War, its program would have probably moved forward more rapidly than was actually the case.²⁰

There were, unfortunately, certain inherent limitations in the methods of sanitary reform. The best work of sanitarians was bound to be largely empirical in nature. Not until the new pathology came to America could they really know what diseases they were dealing with, and they worked rather blindly in consequence. Typhus, a filth disease, they could control; and typhus epidemics became less serious by the mid-nineteenth century. But sanitarians could make no impression on man-to-man contagions like diphtheria, and even some of the insect and water-borne diseases were likely to elude them.

One can observe an analogy here between the limited success of nineteenth century empirical sanitary reform, and the similarly limited success of empirical preventive medicine during the same

²⁰ Richard H. Shryock, “The Early American Public Health Movement,” *American Journal of Public Health*, XXVII (1937), 965 ff.

century. Ordinary medical practice dealt with cures of disease in individuals; sanitary reform attempted to prevent certain diseases from becoming prevalent; there remained the possibility of preventing diseases already abroad in the community from attacking individual members thereof. All three of these procedures, that is, individual treatments, public preventive measures, and individual preventive techniques, offered ways of dealing with the sum total of disease. Preventive medicine—eventually to become one of the most effective forms of practice—was something new in the eighteenth century. An encouraging beginning had been made with the advent of inoculation against smallpox, and in the successful use of citrus juices against malnutrition diseases. Both procedures had a folk origin, were then checked and standardized by physicians, and were finally applied without any rational knowledge of why the remedies worked as they did.

Inoculation against smallpox was, as is well known, introduced into England from Turkey early in the eighteenth century; and was first employed in America during the serious Boston epidemic of 1721. The process was dangerous, and the first efforts of Mather and Boyleston to adopt it in that city led to serious controversy.²¹ No such storm arose in Philadelphia, but the measure was introduced there soon afterwards with varying success—due, perhaps, to the varying techniques that were employed. It will be recalled that Washington ordered the inoculation of his troops in the Philadelphia area. Jenner's great improvement in substituting cow pox for human pox, was rapidly adopted by Philadelphia practitioners after 1800; but what percentage of the town's whole population was vaccinated is unknown.

The partial control over smallpox achieved by inoculation, and the almost complete technical victory won by vaccination after 1800, were from the layman's point of view the most important achievements of medicine between 1750 and 1850. But it will be noted that these empirical procedures led to no further successful preventive measures against infectious diseases, until medical bacteriology subsequently provided a rational understanding of immunological phenomena. And this development of medical bacteriology itself had to wait upon the advent of the new path-

²¹ See Henry R. Viets, *A Brief History of Medicine in Massachusetts* (Boston, 1930), pp. 56 ff.

ology. Bacteriologists could not seek the microscopic causes of certain diseases until pathologists had identified these same diseases. Imagine the confusion of a Pasteur or a Koch if they had been dealing only with such vague notions as "fevers" or "inflammations," rather than with specific concepts of "anthrax," "cholera," and the like. They would have been completely lost, even with the best of microscopes and the most complete laboratory equipment. It is clear, therefore, that all phases of medical progress led to the one essential matter of progress in pathology, just as all roads once led to Rome. To sum up, there could be no rational therapeutics, no adequate surgery, no systematic public hygiene, and no widely effective preventive medicine, until specific diseases were recognized and then traced to their respective lairs.

Just how word gradually reached American physicians that a new pathology was appearing in London and Paris, has not been studied in detail. We do know that young doctors, especially from the three largest cities of New York, Philadelphia, and Boston, began to resort to the Paris schools after 1830. These men, inspired by a new and more critical philosophy, soon returned to this country and promptly led in the repudiation of the speculative tradition in American medicine. One can hardly say, therefore, that Rush, Morgan, and Shippen introduced modern medicine in America. It was rather these young men of the thirties—such leaders as Oliver Wendell Holmes of Boston and William W. Gerhard of Philadelphia—who wrought the great transformation.²² The sharpness of the repudiation of the "old school" was itself a measure of the sweeping change that was involved.²³

Gerhard, who may serve as a representative of the new medicine in Philadelphia, was fortunate in the facilities he found awaiting him there.²⁴ It is probably fair to say that Philadelphia was

²² Holmes' own *Medical Essays* (first printing, Boston, 1861) are replete with the new spirit which, beginning with pathology, infused a more critical attitude into other phases of science and practice. On the French influence see also H. I. Bowditch, *Brief Memoirs of Louis*, etc. (Boston, 1872); Sir William Osler, *An Alabama Student and Other Essays* (New York, 1908).

²³ Richard H. Shryock, *The Development of Modern Medicine* (Philadelphia, 1936), p. 2.

²⁴ Gerhard, by the way, was partly of Pennsylvania German descent—an incidental commentary on the popular impression that these people produced no intellectual leaders. So was Dr. Adam Kuhn, one of the out-

professionally the most advanced center in America. Here, generally speaking, were the oldest and largest medical schools, hospitals, and libraries. Outstanding also were the professional journals and publishing houses. The British tradition had provided, as it were, the necessary institutions; and of these the Pennsylvania Hospital and the Philadelphia General ("Old Blockley") were perhaps the best examples. The French influence gradually infused new life into these organizations.²⁵ Within a few years Gerhard, working after the Parisian manner as clinician and pathologist in the hospitals just noted, successfully demonstrated the distinction between typhus and typhoid (1837). This identification of two distinct diseases, hitherto confused as one "fever," was basic to all further work subsequently directed toward the prevention of their epidemic consequences throughout the world.

The publication of Gerhard's paper on typhoid in the *American Journal of the Medical Sciences*—edited in Philadelphia at this time by the very capable Isaac Hayes—itself encouraged more American students to seek training in Paris. Similar studies, made by Alfred Stillé in Philadelphia and by George B. Shattuck in Boston, probably exerted a like influence. Meanwhile, the work of such British pathologists as Richard Bright gradually became known through British texts and journals. The latter were accessible, because of the common language, to Americans who could not afford to go abroad. It was only a question of time before the anatomical conception of pathology would appear in American textbooks, and from these be dispensed to the profession at large. William Horner's textbook on pathology, the work of a Philadelphia physician, appeared in 1829 and was the first of its kind in this country.

The great pioneer work in this field, however, was that of

standing members of the early faculty of the University of Pennsylvania Medical School, and likewise Dr. Joseph Leidy—probably its most famous member in the mid-nineteenth century. On Gerhard, see the article by John F. Fulton in the *Dictionary of American Biography*, VII (New York, 1931), 218.

²⁵ See Edward B. Krumhaar, "The History of Pathology at the Philadelphia General Hospital," *Medical Life* (April, 1933), pp. 162 ff. Note also the same author's "The Early Days of the American Journal of the Medical Sciences," *Medical Life* (May, 1929), in which he observes (p. 253) that Gerhard's paper did much to encourage American medical students to go to Paris.

Dr. Samuel D. Gross, published while he was at Cincinnati in 1839. Gross, who was reared on a Pennsylvania-German farm near Easton, did not have the advantage of a European education; but he was well trained at Jefferson and after some valuable years in the Ohio Valley, returned to Philadelphia during the fifties to become professor of pathology and surgery in his alma mater. Here he became one of the great figures in American medicine and was so recognized abroad. There was no better text than his in the English language; and this and his other writings on pathology expressed in systematic fashion the new outlook in the medical sciences.²⁶

It is true that the period when Gerhard and Gross were most active, 1835-1870, did not witness much progress in the actual prevention or cure of major diseases. Indeed, pathological research had to be carried on in the death house by apparently cold-blooded men who resisted the siren call for immediate cures. For them, as for the doctor of "Reading Gaol," death seemed but a scientific fact; and they sometimes went so far as to develop a considerable skepticism about therapeutics in general. No wonder that the laity became discouraged. Imagine the feelings of patients—and of conservative doctors as well—when Holmes declared that if most of the medicines in America were cast into the ocean it would be so much better for mankind and so much worse for the fishes! Yet these very cold-blooded pathologists, these "nihilists," were preparing the only basis upon which a succeeding generation could at last build a systematic structure of prevention and cure. Here we have the paradox that the very period of 1830-1870, in which the public became so discouraged about the services of physicians, was actually the most revolutionary and promising one in the whole history of the medical sciences.

Just because the public did become discouraged by medical nihilism they tended to turn, in these years, to expanding quackery and to medical sects which promised all things. Actually, these sects may be viewed as survivals of the older speculative pathologists, with their extravagant theories that all diseases were really simply this and that, and that all could therefore be cured

²⁶ See, on Gross, the works by Esmond Long and Francis Packard, cited above, and particularly his own *Autobiography* (Philadelphia, 1887).

thus and so. The founders of homeopathy, of "Botanic Medicine," of osteopathy, and of "Christian Science" were all in turn the logical descendants of such early system-makers as John Brown and Benjamin Rush—each with an all-pervading cause and an all-sufficing cure. Some of these sects had real merits. But the rejection of their systems by regular medicine after 1840, in itself indicated that medical science had at last come of age.

The most interesting and valuable of the sects, homeopathy, staged its American debut largely in Philadelphia and Boston, and in the former city the Hahnemann Medical College and Hospital remain today its chief representatives. This sect, which at first reduced pathology to its lowest common denominator in the form of "the itch," had been originally introduced in Germany by Dr. Hahnemann as a form of regular medicine. Subsequently, it was gradually rejected by the majority of the profession; although it was probably helpful in protesting the too-heroic character of "allopathic" treatments, and its rational basis may still be defended on historical grounds.²⁷ During the thirties, certain German physicians established a homeopathic school at Allentown; but this was soon abandoned and a similar college was set up at Philadelphia in 1848.

The growth of homeopathy and other sects, the flagrant abuses of commercialized quackery, and the competition of an increasing number of inferior proprietary schools, had meanwhile alarmed the better men in the regular profession. In consequence, Philadelphia acted as host in 1847, for the small gathering of aroused physicians that organized the American Medical Association. One Philadelphian, Nathaniel Chapman, became the first president of the Association; and another, Isaac Hayes, the treasurer. A third, Alfred Stillé, was one of the two first secretaries. The other secretary, Richard D. Arnold of Savannah, had been trained at the University and still felt at this time that "To Philadelphia our profession in other parts of the Union looks for the beacons to guide us onward."²⁸ Here, at the pioneer A.M.A. meeting, was made the first serious effort to set up professional standards

²⁷ See Otto E. Gutentag, "Trends toward Homeopathy, Past and Present," *Bulletin of the History of Medicine*, VIII (Baltimore, 1940), 1172 ff.

²⁸ Richard H. Shryock (ed.), *Letters of Richard D. Arnold, M.D., 1808-1876*, *Papers of the Trinity College Historical Society*, XVIII-XIX (Durham, N. C., 1929), 31.

for the nation as a whole. Unsuccessful at the time, the Association was nevertheless of great potential significance.

In Philadelphia itself, medical education was by no means perfect but continued on a relatively high level as compared with most other parts of the country. By this time, several new medical colleges had been established in the city in addition to the homeopathic institution already mentioned. The University school, which originally had enjoyed a quasi-monopoly on professional education south of New York and a general prestige surpassing all American institutions, seemed to go temporarily "into a decline" after 1830.²⁹ But Jefferson and the Pennsylvania Medical College flourished during the decades that followed, and the University in time took on a renewed vitality. In 1850 the pioneer Women's Medical College was founded—the only one of its type which has survived to the present time.

The story of professional libraries, journals, and publishing houses in the city would also merit considerable attention, if only space permitted. The same may be said of the development of the natural sciences which were so significant for medicine. American chemistry had its beginnings largely in Philadelphia. There were great names among the town's early chemists—Priestley, Rush, Woodhouse, Cooper, and Robert Hare—and the last named brings us down to the period under discussion.³⁰ In like manner, the story of the biological sciences is an important one. One need only recall, in passing, the work of Joseph Leidy and his associates at the Academy of Natural Sciences, in order to appreciate the fact that real research was already under way in the Quaker City by the middle of the last century. Certain of Leidy's studies, notably his work on trichina, were of immediate value to medicine.³¹

It would be a mistake, of course, to hold that systematic research was carried on in any American medical school as early as 1850.

²⁹ Professor Edward P. Cheyney comments upon this in his recently published *History of the University of Pennsylvania* (Philadelphia, 1940). In 1825, just before this temporary "decline" began, the University school still instructed about twenty per cent of all the medical students in the country, Frederick P. Henry (ed.), *Standard History of the Medical Profession in Philadelphia*, p. 152.

³⁰ See Edgar F. Smith, *Chemistry in Old Philadelphia* (Philadelphia, 1919), pp. 6 ff.

³¹ C. A. Pfender, "Joseph Leidy as a Helminthologist," *Bulletin of the Society of Medical History of Chicago*, II (1917), 47 ff.

One should also guard against claiming all things for any one scientific center. Some of the most promising professional developments in American medicine between 1750 and 1850 were to be observed successively in Charleston, Lexington, and Cincinnati, as well as in New York and Boston. The most significant single achievement, the successful introduction of anesthetics in surgery, redounds to the eternal credit of the latter city.³² But if any one place was preëminent as a scientific center in mid-century America, it was certainly the Pennsylvania metropolis. Fifty years after it had ceased to be the national capital, fifty years after it is supposed—by certain contemporary critics—to have lost all originality and initiative, Philadelphia continued to lead the country along lines that already pointed to the more complex civilization of the future. Hence the “new history,” when it gives as much attention to science as it does now to literary or religious trends, will open new vistas of the rôle played by Pennsylvania in the cultural development of the American nation.³³

³² Henry R. Viets, *A Brief History of Medicine in Massachusetts*, pp. 159 ff.

³³ An attempt to suggest such new perspectives is contained in the author's “Philadelphia and the Flowering of New England: An Editorial,” *Pennsylvania Magazine of History and Biography*, LXIV (July, 1940), 305 ff.