

favorable circumstances, is encompassed. Therefore in undertaking a study of American medicine of the eighteenth century we must keep in mind the limitations by which medical men of this country and of that period were circumscribed. We must remember that they lived in a new and sparsely populated country, that they were thousands of miles removed from the centres of civilization, with a broad ocean lying between, which in those days it took weeks to traverse, and when the transit had been accomplished the fountains of medical science from which they could drink were shallow indeed! But they had a thirst for knowledge and many of them sought those springs and imbibed with avidity such knowledge as was to be obtained. They were qualified by preliminary education, too, and it is surprising at what an early age—fifteen years—many of them received their literary degrees. That they were thorough is evidenced by the fact that each one wrote his thesis in Latin and defended the opinions therein expressed in the same language.

There was no medical school in America until after the middle of the eighteenth century. The method of instruction was by a system of apprenticeship which extended over a period of from three to seven years—a most valuable method of instruction, for it brought the student into close contact with his master, enabling him to acquire the latter's methods in the most practical way. Many of these men had been born and educated in Europe before coming to the New World, and their students in turn went to Europe in order to obtain a medical degree. It is not intended to intimate that all practitioners were so well educated, for such was not the case, but in a study of this kind it is only right to give first place to the best.

Considering the sparse population of not more than three hundred thousand at the beginning of the eighteenth century, strung out along the Atlantic seaboard from the rock bound coast of New England to the sunny shores of Georgia, remote from the centres of civilization, we should scarcely expect to find among a pioneer people struggling with the wilderness and battling with savages any who could find time or opportunity for scientific pursuit. Yet there were some who stood as shining lights in science and should be of interest to us as medical men, though they may be overshadowed, in the view of the general public, by the clergy, the statesman, and the soldier.

Perhaps the most interesting and notable event occurring in the medical annals at the beginning of the period with which we are dealing was the acrimonious controversy originating in Boston over the introduction of inoculation for smallpox, the great protagonist of that procedure being the redoubtable Cotton Mather, of witchcraft fame, a distinguished politician and divine.

In 1718, Dr. William Douglass, an educated and astute Scotchman, came to Boston, bringing with him among other scientific papers, one written by an Italian named Timoni and communicated by Doctor Woodward, in 1717, to the Royal Society of London, describing the method of inoculation as practised among the Turks. Though not on the best terms with Mather, Douglass gave him among

AMERICAN MEDICINE OF THE EIGHTEENTH CENTURY.*

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Unlike the moral sciences—which are based on more or less determined principles—medicine as a science has been greatly circumscribed by reason of the small knowledge we have had of the intricate physiological functions of the body, and our no less limited understanding of the pathological changes, as well as dense ignorance as to the causes of these changes, to say nothing of our imperfect understanding of the physiological and therapeutic effect of the so called remedies we are accustomed to use, so that our practice has necessarily been largely empirical. Measured by the light of today, medical men of the eighteenth century—even in the old countries—were groping in the twilight of great uncertainty.

These reflections are not prompted by a censorious spirit, but merely emphasize the difficulty by which the science of medicine, even under the most

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others this paper on Turkish inoculation. Smallpox was raging in and about Boston, and Mather was profoundly impressed with the Turkish method of inoculation. He proposed to Douglass that he give the method a trial, but Douglass ridiculed the idea, as did other Boston physicians to whom Mather proposed it. But the resolute old clergyman was not deterred by the rebuffs of the Boston physicians.

There lived in Brookline, contiguous to Boston, Dr. Zabdiel Boylston, whose father, Dr. Thomas Boylston, an Englishman having the degree of M. D. from Oxford, in conjunction with Dr. John Cutter, an eminent physician and surgeon of Boston, directed his education, though it does not appear that he ever received the doctor's degree. Yet he was a distinguished physician and besides was noted for his interest in botany and natural history. To him Mather proposed that he undertake the work. Boylston readily assented and "entered eagerly into the scheme to stamp out the plague." Boylston must have been a man of strong conviction and rare courage, for notwithstanding the violent and threatening opposition of medical men, the clergy, and the laity, the first subject whom he inoculated was his only son, a lad of thirteen years; then two negro servants were likewise inoculated, all of which operations were entirely successful.

The controversy was sharp and stubborn, the opposition being led by Dr. William Douglass, to whom Mather originally proposed that he initiate the procedure, assisted by Dr. Lawrence Dalhonde, a Frenchman, who had a large practice in Boston. Many of the clergy denounced the practice from their pulpits, and the *New England Courant*, a paper edited in part by Benjamin Franklin, was active in opposition. Mather and Boylston and their supporters were persecuted unmercifully. Boylston was assaulted in the streets, attempts were made to burn his house, and bombs were thrown into his and Mather's houses. Notwithstanding this vehement opposition the practice was so successful that it gained steadily, and doctors established private hospitals for the purpose of inoculation.

Hutchinson, quoted by Packard, says: "In the year 1721, and first part of 1722, Doctor Boylston inoculated 247 persons; thirty-nine were inoculated by other persons in Boston and its vicinity. Of this number only six died, and several of those were supposed to have taken the infection before inoculation. In the same period 5,759 took the disease the natural way, of whom 844 died, and many of those who recovered were left with broken constitutions and disfigured countenances."

Mather wielded a tremendous influence with the clergy, and his prestige was no less potential with the laity, so that he rallied his followers—who had at first opposed him—to the side of inoculation. Here was the remarkable circumstance of the clergy advocating science and the faculty opposing it; but the dominating influence was the cool perseverance of Doctor Boylston, who ultimately experienced the pleasure of having his practice endorsed. That arch objector, Dr. William Douglass, recanted, and Benjamin Franklin was converted to a belief in the utility of inoculation. Boylston's triumph was com-

plete. He was invited by Sir Hans Sloan, physician to George I., to come to London to demonstrate his method, which he did successfully. His reward was great. He was made a member of the Royal Society of London, being the first native American to be so honored. He also received a thousand guineas as a gift from the King.

There were many practitioners of the type of Zabdiel Boylston scattered throughout the colonies. They were men who, though they had not acquired the doctor's degree, had nevertheless been trained by skilled physicians and surgeons who had migrated to the Colonies, and who were, as well, educated in the school of experience and well qualified to treat disease according to the light of their day. These men must not be included with the pretenders and charlatans, of whom there were not a few, for they were conscientious and trustworthy practitioners.

There were also many notable medical men of fine attainments in the various Colonies. They came as surgeons to the King's troops, or were those adventurous spirits who came to the new El Dorado in search of fame and fortune. They were principally from the British Isles. As the colonists acquired wealth, those who undertook the practice of medicine were not content with their apprenticeship, but went to Europe in order to increase their knowledge and obtain the coveted medical degree.

It would be profitable to study some of these men individually, were it within the scope of this paper, for some of them were most interesting and attractive. They were acute observers and beside being skillful physicians they were adepts in botany and natural history. They corresponded with the members of the Royal Society and with the great botanist, Linnaeus, who honored some by naming plants after them. Dr. Howard A. Kelly has found material enough to write a most interesting volume about these botanists.

Dr. John Mitchell, who lived in a small village on the Rappahannock River in Virginia, was a Fellow of the Royal Society of London. He was distinguished as a botanist as well as a physician. Among other papers he wrote one giving an account of the yellow fever which prevailed in Virginia in the years 1737, 1741, and 1742. Some years after his death, the paper came into the hands of Benjamin Franklin, who transferred it to Doctor Rush; he published it and acknowledged his indebtedness to it for information enabling him successfully to combat the disease.

Dr. Hezekiah Beardsley, of Connecticut, was the first to describe congenital hypertrophic stenosis of the pylorus in the infant.

Dr. John Lining, of Charleston, S. C., in the year 1740, made careful studies in metabolism from observations upon himself, ascertaining daily his weight each morning and evening, the weight of food taken, and the weight of his urinary and alvine discharges. These investigations were carried on throughout a year and were published in the *Transactions of the Royal Society of London* in 1743.

Dr. William H. Welch in a discussion said: "Many of these frontier doctors were fully the

equals in education of their contemporaries along the Atlantic seaboard; in Boston, New York, Philadelphia, Charleston. Of course in the middle of the eighteenth century Charleston was perhaps the most cultured centre. There is a wonderful group here that has never been presented to us. I have made many appeals to have this done, by some one from that region, if possible."

Beside being physicians they were men of affairs, taking great interest in the wellbeing of their country. A number of them were in the colonial legislatures—several were lieutenant governors (and practically governors) of the colonies, and no fewer than five were members of the Continental Congress, and, as such, signers of the Declaration of Independence. General Warren, who lost his life at the battle of Bunker Hill, was a doctor, as was General Hugh Mercer, of Virginia, who was killed at the battle of Princeton.

Opportunities for the study of practical anatomy were few not only because of popular prejudice, but because in some of the colonies the study was a legal felony. The bodies of executed criminals were sometimes given for the purpose of dissection, but the prejudice was so great even against that practice that one body which had been given the doctors by the authorities of Baltimore was forcibly taken from them by the infuriated populace.

The famous "doctors' mob" that occurred the same year (1788) in New York city was most serious in its results, and gives evidence of the intensity of feeling in the matter. Some doctors and students were dissecting in the New York Hospital building. A boy peeped in at the window. A dare devil student waved an arm of a cadaver at him, which so terrified the boy that he fled crying down the street, and soon an excited multitude had assembled and hearing his gruesome story made a vicious attack on the building. It was now the doctors' and students' time to run, and, pursued by the mob, they sought refuge in the jail. The police were unable to control the situation, and the militia were called out. The mob remaining defiant and aggressive, the militia fired, killing seven of the rioters and wounding many others.

Doctors are expected and required to know all about the human anatomy, but many obstacles are put in their way to prevent their acquiring such knowledge. A number of sporadic efforts were made in the first half of the century to cultivate practical anatomy, but with indifferent success. It was not until about the middle of the century that it made much progress. The bodies of executed criminals were furnished by the authorities for dissection purposes, but the principal supply of material was obtained by "body snatching."

Historians agree that unquestionably the best anatomist and the equal of any surgeon of his day in this country, was William Baynham, a native of Caroline county, Virginia. He received his preliminary education at home, and when twenty years of age was sent to London and entered St. Thomas's Hospital as a student. Here he made the acquaintance of Mr. Else, the professor of anatomy, whose assistant he became. His skill in injecting and preparing anatomical material was declared to be wonderful.

He remained in London four years and returned to his native colony to settle in Essex county, where he had an extensive practice and a wide reputation as a skillful and successful surgeon. Here is an instance of a scholarly man and skilled scientist remaining in a country district remote from the centres of population attaining success and distinction. There were some great doctors in the years gone by, and geniuses are not to be found within the metropolitan districts only.

Midwifery, in the earlier part of the eighteenth century, was practised almost exclusively by women, except that in some difficult case a doctor might be called to give aid, though the practice of obstetrics by men was extremely unpopular. It was said of Doctor Attwood, of New Jersey, he "is remembered as the first Dr. who had the hardihood to proclaim himself as a man midwife: it was deemed a scandal to some delicate ears, and Mrs. Grany Brown, with her fees of two or three dollars, was still deemed the choice of all who thought women should be modest."

Dr. John Moultrie, a Scotchman, who came to Charleston, S. C., in 1733, was perhaps the earliest regular obstetrician of the colonies. He died in 1773, having stood at the head of his profession in that city. It was said of him: "He was especially distinguished for his skill in obstetrics, and his death was regarded as a public calamity. Several of the ladies of Charleston bedewed his grave with tears, and went into mourning on the occasion. The year after his decease was distinguished by the deaths of several women in childbirth. While he lived they thought themselves secure of the best assistance in the power of man or of art, in cases of extremity. In losing him they lost their hopes. Depressing fears sunk their spirits, and in an unusual number of cases produced fatal consequences."

Dr. James Lloyd, a pupil of William Hunter and Smellie, who settled in Boston in 1752, was probably the first medical man in New England to devote himself to the practice of obstetrics.

Dr. William Shippen, Jr., of Philadelphia, was the earliest teacher of obstetrics in this country, his lectures beginning in 1762.

Dr. John V. B. Tennant, of New Jersey, an alumnus of the University of Edinburgh and a Fellow of the Royal Society, was the first professor of obstetrics of the Medical School of New York.

Dr. George Buchanan, of Baltimore, in 1789, delivered a course of lectures on the Diseases of Women and Children and the next year a course on Midwifery. These sporadic efforts were indicative of a desire for further improvement in medical education.

To the physician the hospital is not only a refuge for the sick and wounded, but is an educational means of vast importance. The first general hospital established in the colonies was the Pennsylvania Hospital of Philadelphia, which was organized in 1751, and in February of the next year advertised that it was ready to receive patients. Dr. Thomas Bond, of Maryland, who had settled in Philadelphia, was its chief projector; he was ably and efficiently seconded by Benjamin Franklin.

This hospital was established on a sound and enlightened basis, as is evidenced by the wise and judicious rules adopted by the board of managers.

M. de Warville, who visited the hospital in 1788, wrote: "I have seen the hospitals of France, both at Paris and in the provinces; I know none of them but one at Besançon that can be compared to this at Philadelphia. Every sick and every poor person has his bed well furnished, but without curtains, as it should be. Every room is lighted by windows placed opposite, which introduces plenty of light. . . . The hospital is fine, elegant, and well kept."

Although the Pennsylvania Hospital provided for the care of lunatics, the earliest institution for the special care of the insane was the Eastern Lunatic Asylum, at Williamsburg, Virginia, chartered in 1772 and opened the next year for the reception of patients.

The second hospital to be founded in the colonies was the New York Hospital, chartered in July, 1771. Doctor Fothergill, of London, was one of the incorporators. Before its completion, the building was almost completely destroyed by fire in February, 1775, but it was quickly reconstructed and the Provisional Congress took possession of it for use as a barracks in April, 1776. When the British entered New York city the same year they used the building as barracks for the Hessians. It was not reopened as a hospital until 1791.

That the colonists were interested in education is obvious from the fact of the establishment as early as in the seventeenth century of Harvard College in Massachusetts, and William and Mary College in Virginia. In the eighteenth century many other colleges were founded, but in none of them was there a medical school, until, in 1765, the medical department of the College of Philadelphia was organized.

The two moving spirits in this adventure were Dr. John Morgan and Dr. William Shippen, Jr. Both were Philadelphians, and both were graduates of the medical department of the University of Edinburgh. They were well qualified for the undertaking. The former was appointed professor of theory and practice of medicine and the latter professor of anatomy and surgery. Other professors were added from time to time, including Dr. Adam Kuhn and Dr. Benjamin Rush. Dr. Thomas Bond, who was the founder of the Pennsylvania Hospital, was appointed to give clinical lectures. Three of these were the most conspicuous medical men of the colonies. Two of them, Morgan and Shippen, were surgeons general of the Continental armies, and Rush was surgeon general of the middle department of the Continental army.

Here was laid, and well laid, the foundation of medical education in this country. Students came in at once and in increasing numbers—there being between thirty and forty in attendance in 1775—when the school was interrupted by the Revolution.

The medical department of King's College, New York city, was organized with a complete faculty, in 1767, and the first regular degree of M. D. in the colonies was conferred upon Samuel Kissam, in March, 1770, by that school, the degree of M. B. having been conferred upon him the preceding year. King's College has become the famous College of Physicians and Surgeons of New York. Turner says: "The honorary degree of M. D. was conferred upon Daniel Turner by Yale College in 1720

As Doctor Turner had been a liberal benefactor of the college, the M. D. was facetiously said to signify *multum donavit*."

The medical department is a most important component of an army, and until very recent years it had received scant consideration. Of course at the time of the Revolution there was no organization whatever, and commissary and equipment materials were almost impossible to obtain, but the medical department was even worse off, for no medical supplies could be had. The few instruments and drugs that were obtainable came mainly from the surgeons' very limited private store. Many of the surgeons were appointed without reference to skill or ability, so that altogether the condition of the medical department was most lamentable. As an evidence of the little material to be had, the "razor" letter from Surgeon General John Morgan, just before the battle of Long Island, in August, 1776, will illustrate:

Sir:—I have sent to the surgeons, desiring the youngest off duty to go to your assistance, and take four mates with him; to carry over five hundred additional bandages, and twelve fracture boxes. I fear they have no scalpels, as whatever I have committed to the hospitals has always been lost. I send you two, in which case, if you want more, use a razor for an incision knife. Let me know, from time to time, at Long Island. J. MORGAN.

To Dr. Warren, Surgeon of the General Hospital at Long Island.

The following extract from *Thacher's Military Journal* for October 24, 1777, will give an idea of the acuteness of intelligent observation on the part of the American surgeon. Referring to the hospital at Albany, he says:

This hospital is now crowded with officers and men from the field of battle. Those belonging to the British and Hessian troops, are accommodated in the same hospital with our own men and receive equal care and attention. The foreigners are under the care and management of their own surgeons. I have been present at some of the capital operations and remarked that the English perform with skill and dexterity, but the Germans, with a few exceptions, do no credit to their profession; some of them are the most uncouth and clumsy operators I ever witnessed and appear to be destitute of all sympathy and tenderness toward the suffering patient. Not less than one thousand wounded and sick are now in this city; the Dutch Church and several private houses are occupied as hospitals. We have about thirty surgeons and mates, and all are constantly employed. I am obliged to devote the whole of my time, from eight o'clock in the morning to a late hour in the evening, to the care of our patients. Here is a fine field for professional improvement. Amputating limbs, trepaning fractured skulls, and dressing the most formidable wounds, has familiarized my mind to scenes of woe. A military hospital is peculiarly calculated to afford example for profitable contemplation and to interest our sympathy and commiseration.

Dr. James Tilton, who was left in charge of the American sick and wounded at Williamsburg, Virginia, after the surrender of Cornwallis at Yorktown, the French troops being encamped at the same place, in his *Observations on Military Hospitals*, says:

Being thus in a French garrison I had some opportunity of observing the French practice and management of their sick. In passing the wards of their hospital, their patients appear very neat and clean, above all examples I had ever seen. Each patient was accommodated with everything necessary, even to a night cap. Nevertheless, they were not more successful than we were. Even their wounded, with all the boasted dexterity of the French to aid them, were no more fortunate than ours. I was led to attribute their

failure principally to two causes. For ease and convenience, they had contrived a common necessary for their whole hospital, the college, a large building three stories high, by erecting a hall hexagon, of common boards, reaching from the roof down to a pit in the earth. From this perpendicular conduit doors opened each floor of the hospital; and all manner of filth and excrementitious matters were dropped and thrown down this common sewer into the pit below. This sink of nastiness perfumed the whole house very sensibly and, without doubt, violated all the air within the wards. In the next place their practice appeared to me to be very inert. When passing their wards with the prescribing physicians, I observed a great number of their patients in a languid and putrid condition and asked occasionally if the bark would not be proper, in such cases. The uniform answer was no, too much inflammation. And when they attended my round of prescription and saw me frequently prescribing the bark, in febrile cases, and even for the wounded, they lifted up their hands in astonishment. Few or no chemical remedies were employed by them. One of their regimental surgeons declared that he never used opium. Their hospital pharmacopoeia consisted chiefly of pisans, decoctions, and watery drinks, fitted only for inflammatory disorders. All these circumstances considered, satisfied my mind why their ample accommodations gave them no advantage of us in the result of practice. I was the more surprised as Doctors Cost and Borgelli appeared to be men of science, well qualified to make research.

During the Revolution the practice of medicine was at a low ebb, both because of the incompetence and dishonesty of most of the surgeons, and the lack of necessary drugs and essential supplies. The following extract from a letter of Washington to Congress in the autumn of 1776 gives his estimate of the surgeons of the army:

No less attention should be paid to the choice of surgeons than other officers of the army. They should undergo a regular examination, and if not appointed by the Director-General and surgeons of the hospital, they ought to be subordinate to and governed by his direction.

The regimental surgeons I am speaking of, many of whom are very great rascals, countenancing the men in sham complaints to exempt them from duty, and often receiving bribes to certify indispositions with a view to procure discharges or furloughs.

But independent of these practices, while they are considered as unconnected with the general hospital, there will be nothing but continual complaints of each other—the director of the hospital charging them with enormity in their drafts for the sick, and they him for denying such things as are necessary. In short, there is a constant bickering among them, which tends greatly to the injury of the sick, and will always subsist till the regimental surgeons are made to look up to the Director-General of the hospital as a superior. Whether this is the case in regular armies or not, I cannot undertake to say; but certain I am, there is necessity for it in this, or the sick will suffer. The regimental surgeons are aiming, I am persuaded, to break up the General Hospital, and have in numberless instances drawn for medicines, stores, etc., in the most profuse and extravagant manner for private purposes.

To illustrate the scarcity of food and hospital supplies in 1778 the letter of Dr. John Warren is quoted:

To His Excellency the Governor and the Honorable the Council of The Commonwealth of Massachusetts:

Gentlemen—Though I have frequently represented the distressed condition of the sick in the Continental Hospital, yet I have never had so ample occasion to deplore their miseries as at present.

For some days they have not had an ounce of meat; not a stick of wood but what they have taken from the neighboring fences; for near a week not a vegetable; and scarcely any medicine for above a year. In fine, to sum up the whole in a few words, the sick and wounded, many of which are exceedingly dangerous, and some of them in a state which requires immediate amputation, are not furnished by the public with a single article of sustenance

except bread alone, and must have perished ere this had not the charitable donations of a few individuals in some measure contributed to their relief. I have been incessantly making application for these last twelve months to all the departments for supplies, but cannot procure any. During which time the groans of the sick and wounded, suffering and perhaps dying, for want of necessities, have been perpetually saluting my ears. I must, therefore, beg your Excellency and Honor's action in this matter, and am with the greatest respect, gentlemen,

Your most obedient servant,

J. WARREN.

With the close of the Revolutionary War there was a quickening of enterprise and medicine received its degree of stimulation too. The College of Philadelphia was merged with the University of Pennsylvania and the medical department went forward with renewed energy and success. In 1783, Harvard Medical School began its honored career. Medical societies were formed and every energy that tended to forward medicine in this new era was active. There were no startling events in medicine in this country in the eighteenth century. Not many papers and few books were written. But the medical men were keen observers and alert to avail of all progressive means. Considering the period—the remoteness of the new country and its difficulties, not much could be expected.

3 THOMAS CIRCLE.