

An Historical Sketch of the State of Medicine in the American Colonies, from their first settlement to the period of the Revolution. By JOHN B. BECK, M.D., &c.

(Communicated by the author.)

The profession of medicine must ever occupy a conspicuous station in the scientific history of a nation. Independently of its being devoted to purposes of high utility and exalted benevolence, the necessary alliance which there exists between medicine and the other departments of science, will always confer upon it a peculiar pre-eminence over every other professional pursuit. So intimate, indeed, has been this alliance, that we shall find on the one hand, medicine receiving laws in succession from philosophy, mathematics and chemistry; and on the other hand, the members of the medical profession will be recognised to have been, in every age and country, among the most successful cultivators of general science. What the effects of this association have been, it is not material at present to inquire. It is sufficient to state the fact itself, to show the importance of medical history. In this country, the history of medicine derives an additional interest from the striking illustration which it presents of the influence which our peculiar form of government exerts over the character and progress of science. It is unquestionably true, that our medicine participates largely of that spirit of independence, which characterises the civil and political institutions of our country. It was not, however, until after the revolutionary war, that this was the case, when the medical mind of our country received an impulse to which it had hitherto been a stranger. That portion of its history which has been selected as the subject of the present sketch, was not so fortunate. It ought not on that account, however, to be neglected, and I have judged that it would be neither useless nor uninteresting to present a sketch of it to a society, which has aided, in no small degree, to advance the character of our profession. It will serve to contrast the past with the present state of our art, and at the same

time recall to our grateful remembrance the memory of many distinguished men, who, amid numerous discouragements, did much to elevate and adorn it.

As may naturally be presumed, in a country circumstanced as the American colonies were for a long period after their original settlement, the medical profession continued for a succession of years in a low and degraded condition. In point of respectability, it undoubtedly stood lower than either the legal or theological professions. The religious difficulties in England had filled the ranks of the latter with men of learning, talents and piety—while the offices of honor and emolument under the crown, offered allurements sufficiently powerful, to induce many who were distinguished in the law, to emigrate to this western world. With medicine it was far otherwise. It is only in populous towns and cities that our art can flourish, and the wilds of America, however fragrant they might be with the spirit of freedom, offered no attractions to the medical men of the old world. The advantages attending an emigration were too distant and precarious to warrant such a step; and accordingly for along time, with some few exceptions, none but those who had failed to attain respectability or employment at home, would venture on so dangerous an experiment. Nor were the young native physicians for a long time calculated to remedy the evil. To become a well qualified physician, requires a course of study and a variety of observation which was not to be obtained in any of the colonies. There were neither lectures nor hospitals which could be resorted to, while the great expense attending a foreign education put it out of the power of all, except a favored few, to avail themselves of the only means of becoming regularly instructed. Under such circumstances it was not to have been expected, for a long series of years after the first settlement of the country, that our profession would be at all distinguished for character or knowledge. The progress of civilization, an augmenting population, together with the increasing facilities of European communication, tended gradually to meliorate this condition of things, and for many years preceding the revolution, medicine could boast of not a few names who shed a lustre upon the profession to which they belonged.

With these preliminary remarks, I propose to give a brief sketch of the state of medicine in this country anterior to the revolution,

and, for the sake of convenience, shall consider it under the three divisions of *medical practice*, *medical literature* and *medical institutions*.

MEDICAL PRACTICE.

The earliest practitioners of medicine in this country appear to have been the clergy—this was at least the case in New England, where, for several years after the first settlement of the colony, the functions of the physician and divine were performed by the same individual. This combination has not been uncommon in the history of the world. In the early dawn of medicine, the priests of Egypt and Greece collected and preserved what was known of the healing art, and in the infancy of every country the same association will probably be found to exist. Nor is it, by any means, an unnatural one. Physical and moral evil are so intimately connected that those who are administering relief to the one, cannot be regardless of the other. Hence, in the absence of the regular physician, the priest appears to be his most proper representative. Besides this, the character of the first emigrants, and the high tone of religious feeling which drove them for an asylum to this western world, continued for a long time to give a preponderating influence to the clergy, in all the secular as well as religious concerns of the colony. In the annals of the first colonists, accordingly, will be found the names of several clergymen who practiced the healing art. These men were not, as might perhaps be inferred, mere empirics. On the contrary, they were by no means unqualified to practice medicine. For several years, previously to their leaving England, and anticipating the loss of their situations as clergymen, many of them had turned their attention to the study of medicine, and for upwards of a century after the settlement of New England, numbers of the native clergy were continually educated to both professions. Altogether they were a highly respectable class of men. Besides being good divines, they were skilled in the medical learning of the day, and many of them appear to have been good practical physicians.* Besides the clergy, some

* One of the last of this class of men, at least of any eminence, was the *Rev. Jared Ezzet*. He was born in 1685 and died in 1763. He was a graduate of Yale College, and from 1709 until his death was minister at Killingworth in Connecticut. He published several sermons and was so devoted to his clerical duties, that it is said that for "forty successive years in the course of his ministry, he never omitted preaching either at home or abroad on the Lord's day." He was the most eminent physician of his day in Connecticut. He appears to have read Hippocrates, Galen,

of the first governors of the eastern colonies also practised physic. Two of them, of the name of Winthrop, appear to have been particularly celebrated. One of them was governor of Massachusetts; the other of Connecticut and New Haven. Of the latter, Cotton Mather says: "he was furnished with *noble medicines*, which he most charitably and generously gave away upon all occasions."* He was a member of the Royal Society of London, and some of his communications are to be found in their transactions. Amid such practice, however, as this must necessarily have been, it is easy to conceive that nothing could be done to improve the state of medicine, and that the greatest facilities must speedily have been offered for successful imposition upon the credulity of the public. This supposition is fully confirmed by the fact that so early as the year 1649, the following law was passed in Massachusetts, evidently intended to correct existing abuses.

"Forasmuch as the law of God allows no man to impair the life or limb of any person but in a judicial way :

"It is therefore ordered, that no person or persons whatsoever, employed at any time about the bodies of men, women, or children, for preservation of life or health, as chirurgions, midwives, physicians or others, presume to exercise or put forth any act contrary to the known or approved rules of art, in each mystery and occupation, nor exercise any force, violence or cruelty, upon, or towards the body of any whether young or old, (no, not in the most difficult and desperate cases,) without the advice and consent of such as are skillful in the same art, (if any such may be had,) or at least of some of the wisest and gravest there present, and consent of the patient or patients, if they be *mentis compotes*, much less contrary to such advice and consent, upon such severe punishment as the nature of the fact may de-

Aretæus, Celsus, &c., in their original languages, and he was so skillful in his management of Chronic diseases especially, that he was frequently called in consultation to Boston, Newport and other places. Besides this he was not inattentive to matters of science and philosophy. He was the correspondent of Bishop Berkeley and Dr. Franklin, and in "the year 1761 received from a society in London a Gold medal, as a premium for his discovery for extracting Iron from black sand." He is also said to have introduced the white Mulberry into Connecticut, and with it the Silk worm and published a treatise on the subject. In fine, he was a man eminent for his piety—his learning and skill in medicine, and his philanthropy. See *Eliot's Biographical Dictionary*, and *Thacher's Medical Biography*.

* *Magnalia Christi Americana*, or the Ecclesiastical history of New England, from 1620 to 1638. Fol. p. 19. London, 1702.

serve; which Law, nevertheless, is not intended to discourage any from all lawful use of their skill, but rather to encourage and direct them in the right use thereof, and inhibit and restrain the presumptuous arrogance of such as through confidence of their own skill, or any other sinister respects, dare boldly attempt to exercise any violence upon or towards the bodies of young or old, one or other to the prejudice or hazard of the life or limb of man, woman, or child.”*

This appears to have been the very first attempt of the civil authority, in any of the colonies to put a restraint upon those who pretended to the practice of physic. Salutory as this law may have been, in some respects, it afforded but a slender protection against the existing deficiencies in the profession. It made no provision for the education of medical men, and it established no test of their qualifications.

The State of New-York, I believe is entitled to the honor of adopting the first effectual measures for regulating the practice of medicine. This was not, however, until so late a period as 1760, when the General Assembly of the Province ordained that “no person whatsoever should practice as a physician or surgeon, in the city of New-York, before he shall have been examined in physic or surgery, and approved of and admitted by one of his majesty’s council, the judges of the supreme court, the king’s attorney general, and the mayor of the city of New-York, for the time being, or by any three or more of them, taking to their assistance for such examinations such proper person or persons as they in their discretion shall think fit.” If the person so examined was approved, a certificate was given, allowing him to practice physic or surgery, or both, throughout the province. In case of non-compliance, the penalty was a fine of five pounds.†

In 1772 a similar law was adopted in New-Jersey.‡ These examples were not imitated in the other colonies, where the practice continued unrestrained, and physicians were responsible to no authority for mal-practice. In Connecticut an attempt was indeed made to effect a reformation in this respect, but so strong was the current of prejudice against the measure, that it completely failed.§ As far as my investigations have extended, the foregoing is all that was done, or even attempted by the constituted authorities, in behalf of our pro-

* An act respecting chirurgions, midwives, and physicians. See ancient charters and laws of Massachusetts Bay. p. 76, 7.

† See Appendix A.

‡ See Appendix B.

§ See Appendix C.

profession, previous to the revolution; and it shows conclusively how little its present respectability is owing either to the colonial governments, or to the mother country.

During the period embraced in this sketch, the division of practice into distinct departments, so generally adopted in Europe, was not recognized in this country. Both physic and surgery were practised by the same individuals; besides this, it was the general custom for physicians to prepare and compound their own medicines. In the year 1765, Dr. John Morgan, a distinguished physician of Philadelphia, endeavored to introduce a change into the existing mode of practice, by recommending a separation of it into the three branches of physic, surgery and pharmacy, and appropriating each of these departments to a separate class of practitioners. Having spent several years of his life in the acquisition of professional knowledge in countries where he had seen the practical operation of this system, he became deeply impressed with the importance of it to improve the character of the profession at home. On his return, he accordingly, not merely recommended it in a discourse which he published, but adopted it in his own practice. Although in every respect fully accomplished, he consequently declined in engaging in any surgical operations, and confined himself entirely to medicine.* Whatever may be thought of the general utility or propriety of such a plan, it was undoubtedly at that early period somewhat premature, and probably did not meet with much encouragement.

Until about the middle of the last century, midwifery was exclusively in the hands of females, and physicians were called in only in preternatural and tedious cases. According to Dr. Bartlett, of Massachusetts, Dr. James Lloyd was the first systematic practitioner in midwifery in that section of the United States. He had enjoyed the instructions of Warner, Sharp, Smellie and Hunter, of London, in 1753, and in the following year settled in Boston.† In 1756, Dr.

* "A discourse upon the institution of medical societies in America; delivered at a public anniversary commencement, held in the college of Philadelphia, May 30 and 31, 1765; with a preface containing among other things, the author's apology for attempting to introduce the regular mode of practising physic in Philadelphia. By JNO. MORGAN, M. D.; Fellow of the Royal Society at London; correspondent of the Royal Academy of Surgery in Paris; member of the Arcadian Belle Lettres Society at Rome; Licentiate of the Royal College of Physicians in London and Edinburgh, and Professor of the Theory of Practice and Medicine in the College of Philadelphia. Philadelphia, 1765. p. 63."

† Medical Communications and Dissertations of the Mass. Medical Society, vol. 2, p. 244.

William Shippen, jr., on his return from Europe, commenced the same branch of professional business in Philadelphia; and although at this period physicians were scarcely ever employed in natural labor, it is stated by his biographer, Dr. Wistar, that he did away completely with this prejudice, and in the course of a few years was fully occupied.*

These are the two first physicians employed as regular accoucheurs in this country, of whom we have any notice; and they deserve especial commendation, as having led the way in overcoming deep-rooted prejudices, and in transferring to the profession, from the hands of ignorant and uneducated females, the practice of a difficult and delicate art.

From the connection subsisting between the mother country and the colonies, as may naturally be presumed, the same doctrines prevailed in both, and the practice was essentially the same. At the beginning of the eighteenth century the celebrated Boerhaave commenced his career. Gifted with every endowment natural and acquired—a mind powerful and generalizing—a fascinating eloquence—learning the most varied and profound, and a character radiant with every virtue, this great man was eminently qualified to take the foremost lead in the medical world. Not merely the age in which he lived bowed at once to the supremacy of his genius, but his doctrines continued to control the opinions and practice of medical men during the larger portion of a whole century. The leading feature in the system of this distinguished theorist, was the great and undue importance which he gave to the fluids in the production of disease. These, according to him, became variously changed, not merely in their physical properties but in their chemical composition. They became morbidly thick or thin, while they were contaminated by acid and alkaline acrimonies, and various other morbid matters. To such conditions of the fluids diseases were attributed; and medicines were supposed to act by counteracting and changing them. Such were the doctrines prevalent in the old world during the last century. Their influence was no less undisputed in this country, and the general practice was modified by them. In the management of diseases, medicines were accordingly given with the view of thinning

* Eulogium on Dr. William Shippen. By Caspar Wistar, M. D. Philadelphia, 1818, p. 81.

or incrassating the blood, and altering its qualities. Much confidence was placed in the powers of nature, and the results of critical days watched with the greatest anxiety. On these, it was supposed that the *materies morbi* was discharged, and thus the relief of the patient effected. This matter was looked for chiefly in the urine, and according to Dr. Rush, "glasses to retain it were a necessary part of the furniture of every sick room."* In the treatment of fevers, sudorific medicines were principally resorted to, and to aid their operation, and to facilitate the elimination of the morbid matter, the supposed cause of disease, patients were confined to their beds, and cool air denied them in the most rigid manner. Bleeding was not a general remedy in fever. In yellow fever, so far as we can judge from the opinions of a single individual, it was considered of doubtful and even dangerous tendency.

Dr. John Mitchell, a distinguished physician of Virginia, in his account of the yellow fever which prevailed there in the years 1737, '41 and '42, in speaking of this subject, says, "plentiful bleeding is a means commonly found most effectual to obtain this end, (i. e. to ward off local inflammation) in the benign inflammatory fevers; but we cannot apply this most effectual remedy in this disease, because it evacuates only or chiefly the red globules of the blood, which, as we see by its state, taken notice of above, are in too small a proportion already; and bleeding further breaks the texture of the blood, which above all things is to be avoided in this disease; for after plentiful bleeding, the pulse sinks, or at least is so low and feeble about the state of the disease as to prove of dangerous consequence; which some instances I have known seem to confirm."† He did not, however, discard bleeding altogether. In small quantities he found it serviceable to prepare the system for other evacuations. The remedies which he principally relied on were sudorifics, but more especially cathartics. Upon the importance of this latter class of remedies, he dwells with peculiar urgency, and many of his views are characterized by great good sense and practical acumen. It was entirely by the observations and suggestions of this physician, that Dr. Rush, as he himself frankly acknowledges, was afterwards led to the free use of purgatives in the yellow fever of 1793.

* Rush's Obs. and Inqs., vol. 4, p. 396.

† American Medical and Philosophical Register, vol. 4, p. 196.

In relation to yellow fever, the prevalent opinion at this period was, that it was a contagious disease. Both Drs. Mitchell* of Virginia, and Lining of Charleston, express decided opinions on this subject.† Dr. Lining, too, expresses the belief, that like small pox and measles, it does not attack the second time.‡ It is hardly necessary to state, that the accurate and extended observations of more recent times have completely disproved both these positions. Indeed, if there be any one point in medicine which may now be looked upon as *settled*, it is that the yellow fever is not a contagious disease; and numerous observations incontestibly show that it may assail the human constitution a second time.

According to Dr. Rush, in his account of the state of medicine between the years 1760 and 1766, blood letting was used plentifully in pleurisies and rheumatisms, but sparingly in all other diseases; § a practice, it must be admitted, much more judicious and safe, to say the least, than the indiscriminate and sanguinary practice which was afterwards adopted by this distinguished theorist. At this period, ac-

* Dr. Mitchell defines the disease in the following terms: "This distemper may be defined to be a pestilential fever, proceeding from a *contagious miasma sui generis*, which inflames the stomach and adjacent viscera, obstructs the biliary ducts, and dissolves the adipose humours; to which generally succeeds an effusion of a bilious, or other yellow humour upon the external or internal surface of the body, unless prevented by some other means." (*Medical and Philo. Reg.*, vol. 4 p. 182.)

† Dr. Lining says, "this fever does not seem to take its origin from any particular constitution of the weather, independent of *infectious miasmata*." Again he says, "that this is really an *infectious* disease, seems plain, not only from this, that almost all the nurses caught and died of it, but likewise, as soon as it appeared in town, it soon invaded new comers, &c." At the same time he states a fact which overthrows altogether his doctrine of contagion; it is this, "although the infection was spread with great celerity through the town, yet, if any from the country received it in town, and sicked on their return home, the infection spread no farther, *not even so much as to one in the same house*." (*Edinburgh Essays and Observations*, vol. 2, p. 401.)

‡ "The subjects which were susceptible of this fever were both sexes of the white color, especially strangers lately arrived from cold climates, Indians, mistees, mulattoes, of all ages, excepting young children, and of those *only such as had formerly escaped the infection*. And indeed it is a great happiness that our constitutions undergo such alterations in the small pox, measles, and yellow fever, as forever afterwards secure us from a second attack of those diseases." He then adds an interesting fact concerning the negro. "There is something very singular in the constitution of the negroes, which renders them not liable to this fever; for, though many of these were as much exposed as the nurses to the infection, yet I never knew one instance of this fever amongst them; though they are equally subject with the white people to the *bilious* fever."—*Edin. Essays and Obs.*, vol. 2, p. 408.

§ Observations and Inquiries, vol. 4, p. 396.

cording to the same authority, some of the most potent and useful articles of the *Materia Medica* were but partially exhibited, owing to the prejudices of the public, and in some measure to the fears of the physician. Among them were the Peruvian bark and opium, both of which it was frequently necessary to disguise by admixture with other medicines. Blisters were generally used, but their application was confined to the last stages of fevers. Dr. Rush says, "wine was given sparingly even in the lowest stages of what were then called putrid and nervous fevers."* Nevertheless, I find that so early as 1746 the liberal use of wine in typhus fever was recommended by that distinguished physician, Dr. Colden, lieutenant governor of the colony of New-York. In the year just mentioned, a fever of this description prevailed epidemically at Albany, and in many cases proved fatal. "It had the appearance of a remittent, with frequent low pulse, except in the paroxysms, when it was high; a dejection of spirits, great restlessness, an entire prostration of appetite, clammy sweats of a rancid putrescent smell." By the physicians of the place, it had been treated as an intermittent, but without success. By the advice of Dr. Colden, Madeira wine, to the extent of a wine glass full every four or five hours, was ordered, and with the happiest effects. One patient who recovered, drank a gallon in a few days. In all those cases the wine was given in the last stages of disease.†

Dr. Chalmers too, of South Carolina, who practised at the period alluded to by Dr. Rush, in speaking of the "*Putrid bilious fever*," recommends the use of wine, in the most unequivocal manner. "In the bilious fever we now speak of," says he "the use of wine is indispensably necessary; nor can the quantity of it be assigned; for the sighing and redoubled respiration, the excessive languor, muttering low sort of delirium, and want of heat in the extreme parts, together with a clamminess on the backs of the hands, or more general cold sweats, plainly point out the great want of excitement in the vital and animal functions. Red port wine may therefore be given, punch and other spirituous and vinous fermented liquors of the greatest strength, ought to be liberally allowed in these cases, with this only proviso, that the head be not too much affected thereby."‡

* *Observations and Inquiries*, vol. 4, p. 399.

† *London Medical Observat. and Inquiries*, vol. 1 p. 215.

‡ *On the climate and diseases of South Carolina*, vol. 1, p. 163.

Although the physicians in the colonies generally followed the prevalent practice of the mother country, yet they are entitled to the credit of originating some modes of practice of great value. The most important of these is the application of mercury in the treatment of inflammatory complaints. This practice took its origin as far back as the year 1736, and the credit of originality is generally conceded to Dr. Douglass, a physician of Boston, by whom it was used in the angina maligna which prevailed extensively over the colonies at that period, and committed the most dreadful ravages.* By Dr. James Ogden, a respectable physician of Long Island, this practice was extensively applied in the same disease about the year 1749.† The preparation of mercury which was used was calomel. In consequence of the success which attended the use of this remedy in this disease, it was shortly after resorted to in other inflammatory complaints; and about the middle of the last century, it was in common use in this country in pleurisy, pneumonia, rheumatism, and others of the phlegmasiæ. I am aware that the credit of this practice is claimed elsewhere;‡ but there can be no doubt that in its origin it is exclusively American, and that to our colonial physicians the world is indebted for one of the greatest improvements ever made in practical medicine.

Among the events which characterized the history of our colonial medicine, the most remarkable, and certainly the most exciting, were those which attended the introduction of the practice of inoculation for the small pox. This was first introduced into this country in the year 1721; and it is to a clergyman, Dr. Cotton Mather, that the honor belongs of having first recommended it. During this year the small pox raged in Boston with unparalleled fury and fatality. Dr. Mather having read, in the transactions of the Royal Society of London, an account of a new mode of mitigating the violence of the disease by inoculation, as practised in Turkey, communicated it to the physicians of the place, and urged their adoption of it. With the

* *New England Journal of Medicine*, vol. 14, p. 4.

† *New-York Med. Repository*, vol. 5, p. 97.

‡ Dr. John Armstrong, in his work on Typhus, gives the sole credit of this practice to Dr. Robert Hamilton of Lynn Regis. In another place, I have shown the incorrectness of this statement. (See *Infant Therapeutics*.) From the account of Dr. Hamilton himself, it appears that his attention was not called to the practice until the year 1764; whereas it had been in very general use in this country many years before.

exception of one individual, it was unanimously opposed by the faculty. This individual was Dr. Zabdiel Boylston, who, with the confidence of an honest and enlightened mind, commenced his operations upon his own children and servants.* The controversies which ensued were of the most ferocious and disreputable character. Such was the tempest of popular indignation raised against the practice, chiefly by the inflammatory conduct of the physicians, at the head of whom was Dr. Douglass, that both Drs. Mather and Boylston were in danger of losing their lives. Passion and prejudice on the one side were, however, met by decision and success on the other; and inoculation, defended by almost all the clergy, many of whom preached and wrote in its defence, soon triumphed over opposition, and became prevalent in Boston and the neighboring towns. From thence it was introduced into the other colonies, and although uniformly resisted at first, the public mind became gradually reconciled to it. So early as 1738, it was practised in Charleston, S. C., during the epidemic small pox which then prevailed there. In 1759 it was generally adopted in Philadelphia, where its dissemination was very much facilitated by a defence and recommendation of it by Dr. Redman. The true merit of Dr. Boylston, in relation to the introduction of inoculation, will not be appreciated unless it is stated that at this time the practice had only just found its way into Europe. By a singular coincidence, the first case of inoculation in Europe took place in England in April, 1721, only two months before the first experiment of Dr. Boylston, and entirely without his knowledge. This was the case of the daughter of Lady Wortley Montague. This celebrated female, during her residence in Constantinople, having become acquainted with the safety of the practice, had her son inoculated, and on her return to England, her daughter was subjected to the same operation, and with perfect safety.† This led the way

* The first experiments by Boylston were made on the 27th June, 1721, on his own son, thirteen years of age, and two blacks in his own family, one of thirty-six and the other two years of age, and all with success. During the prevalence of the small pox in that and the following year, he inoculated with his own hand two hundred and forty-seven of both sexes, from nine months to sixty-seven years of age. Thirty-nine were inoculated by other physicians after the tumult had somewhat subsided, making in all two hundred and eighty-six, of whom only six died. During the same period, 5,759 had taken the natural small pox, 844 of whom had died. See Thacher's Medical Biography, p. 163.

† The history of the inoculation of the small pox, &c. By William Woodville, M. D. vol. 1, p. 85.

to the speedy diffusion of the practice in England, as the experiments of Boylston did in this country. It is gratifying to know, that although opposed and slandered at home, this eminent physician was appreciated abroad. In 1725 he visited England, and was received with the highest favor and attention by the most distinguished characters in the nation, and even by royalty itself. He was elected a fellow of the Royal Society, being the first instance in which that honor was conferred upon an American.

Among the practices peculiar to the colonies, was the administration of mercury as a preparative to inoculation. By the illustrious Boerhaave, it had before been suggested that mercury would prove an antidote to small-pox; and from him, no doubt, the hint was taken. In 1724, Dr. Huxham also recommended calomel, not merely in the natural small pox, but also when inoculated. † It was only in the colonies, however, that the practice was tried on a large scale, and an interesting account of its effects has been left us by Dr. Benjamin Gale, of Connecticut, in a paper published in the Philosophical Transactions for 1765. The credit of the practice is given by him to Dr. Thomas, of Virginia, and Dr. Munson, of Long-Island, by whom it was established in 1745. According to the statements of Dr. Gale, it appears that the deaths from the natural small-pox, before inoculation was introduced into New-England, averaged 1 in 7 or 8; when inoculation was introduced, the deaths amounted to 1 in 30. By improvements and proper precautions, they were reduced to 1 in 80 to 100; and finally, by preparing the system by the previous use of mercury, the deaths were only 1 in 800 or 1000.*

For the early and prompt investigation, as well as the sound and original views which they advanced in relation to the pathology and treatment of that acute and now well-known disease, croup, our colonial physicians are entitled to the highest applause. Although not unknown or unnoticed previously, the credit is generally conceded to Dr. Home, of Edinburgh, of having given the first full description of this disease. This appeared in 1765. In 1771, Dr. Crawford published his "*Disquisitio Inauguralis de Cynanche Stridula*;" and in

† Woodville's History of Inoculation, vol. 1, p. 342.

* Historical Memoirs, relating to the practice of Inoculation for the Small-pox, in the British American Provinces, particularly in New-England. By Benjamin Gale. See Philosophical Transactions, abridged, vol. 12, p. 229.

1788 appeared the elaborate work of Michaelis of Gottingen, entitled "Dissertatio Inauguralis de Angina Polyposa sive membranacea." These were all the foreign publications which had appeared on this interesting subject. Between the years 1770 and 1781, in this country, Drs. Rush, S. Bard, Chalmers, Middleton and Bayley, all published in relation to it, and by them, especially the two latter, more correct views were enforced than had been entertained by Home and others. Contrary to the opinion of Home, that the secretion of mucus on the inside of the trachea was the cause of the disease, Dr. Bayley established the fact that the disease was an inflammation of the mucous membrane of the trachea, and that the effusion and false membrane were the consequences of this inflammation. Based upon the idea that it was an acute and rapid inflammation, the treatment recommended was of the most decided character. Blood-letting *ad deliquium*—the free use of tartar emetic, at first to produce vomiting, and then to keep up nausea, together with the free use of calomel, were all originally recommended by them, although the credit of every one of them has since been claimed by others.* In determining the true nature of this disease, as well as the treatment most efficacious, the merit of Bayley stands pre-eminent, and the tract which he has left upon this subject, is sufficient of itself to establish his reputation as an original observer and an able and accomplished practitioner. †

* As a sample of the manner in which practices originating in this country, are appropriated abroad, not from design, but ignorance, the following may be adduced. Dr. Stokes, in his recent and invaluable treatise on diseases of the chest, in speaking of tartar emetic in croup, holds the following language: "For the introduction of this inestimable remedy in the treatment of the croup, the science is indebted to Dr. Cheyne. In his Essay on Cynanche Trachealis, published in Edinburgh in 1801, we find the treatment recommended; and it is no small evidence in its favor, that in the year 1832, after an experience greater than falls to the lot of most men, the opinions of this philosophical investigator of disease have remained unaltered. How changed would be the character of medicine, if, in support of many of our remedies, there could be brought forward such evidence, and such an advocate." P. 144, Amer. Ed. Dr. Bayley recommended and used the same remedy, in the same way, and with the same objects in view, a quarter of a century before.

† Cases of Angina Trachealis, with the mode of cure: in a letter to William Hunter, M.D., &c. By Richard Bayley, Surgeon. Printed, New-York, 1781. For the purpose of showing the views of Bayley in relation to the nature and cure of this disease, I shall quote the following from his paper: "When the Angina Trachealis is theoretically considered, there will probably be formed, (as is generally the case when facts are not ascertained) opinions as various as the information and different faculties of men may suggest. I am induced to adopt the following: That the larynx, aorta arteria, and bronchial pipes, have one common

If we may believe the authority of Dr. Douglass, who wrote about the year 1753, and of Smith, the historian of New-York, the general character of the profession could not have been very elevated, and quackery must have flourished in great perfection.* Douglass speaks of it in the following terms: "In general, the physical practice in our colonies is so perniciously bad, that excepting in surgery, and some very acute cases, it is better to let nature, under a proper regimen, take her course, than to trust to the honesty and sagacity of the practitioner; our American practitioners are so rash and officious, the saying in the apocrypha, (38 and 15,) may with much propriety be applied to them. *He that sinneth before his Maker, let him fall into the hands of the physician!* Frequently, there is more danger from the physician than from the distemper. Our practitioners deal much in quackery and quackish medicines, as requiring no labor of thought or composition, and highly recommended in the London quack bills,

membrane, which, we are informed by injection, consists of little more than an infinity of blood-vessels, and consequently liable to inflammation, as all vascular parts are. An increased action of these vessels (as in pleuritic and puerperal fevers) occasions a preternatural secretion of lymph, which from the ingress and egress of the air becomes condensed, and assumes the appearance of a membrane, and its compactness will depend upon the age and habit of the patient and the state of the atmosphere.

"The common opinion is, that those who die of this complaint are suffocated by the membrane's closing the wind pipe. Another more respectable opinion is, that a spasm of the muscles of the larynx closes the scene. The circumstances which precede death in this disease, compared with those appearances which have regularly taken place in the cases which I have seen successfully treated, sufficiently explain the cause of the patient's death from the laws of the blood's circulation. To preserve the healthful state of an animal, it is necessary that the whole mass of blood should circulate through the lungs in a given time, and the free admission and expulsion of air contributes to this regular process; the change, also, which gradually takes place in the lungs, seems more directly to account for the swelled face, tumid jugulars and the full staring eyes, which are symptoms that accompany the progress of this complaint; and add to this, the larynx, aspera arteria and bronchia have been found pervious in every subject I have dissected, while the ramifications have been as regularly filled with a glairy mucus."

"From what precedes, it is obvious that the angina trachealis is considered as an inflammatory disease the treatment of which must vary in every degree, according to its violence: and though the common antiphlogistic treatment will in some cases relieve, if early applied, yet the most desperate may yield to repeated bleedings ad deliquium from the jugulars, the free use of tartar emetic and other evacnants, with a large blister covering the larynx and aspera arteria, while the mucus filling up the ramifications of the bronchia may be emptied by the action of vomiting." See New-York Medical Repository, vol. 14, p. 346. Although not published until the year 1781, the paper of Bayley contains the results of his observations and practice for a number of years previously.

* History of New-York, by William Smith, A. M. p. 326.

(in which all the reading of many of our practitioners consists,) inadvertently encouraged by patents for the benefit of certain fees to some offices, but to the very great damage of the subject." "In the most trifling cases, they use a routine of practice. When I first arrived in New England, I asked a most noted facetious practitioner what was their general method of practice; he told me their practice was very uniform: bleeding, vomiting, blistering, purging, anodynes, &c.; if the illness continued, there was *repentendi*, and finally *murderandi*; nature was never to be consulted or allowed to have any concern in the affair: What Sydenham well observes is the case with our practitioners: *Æger nimia medici diligentia ad plures migret.*"*

Smith, who wrote in 1758, says, "few physicians among us are eminent for their skill. Quacks abound like locusts in Egypt, and too many have recommended to a full practice and profitable subsistence. This is the less to be wondered at, as the profession is under no kind of regulation. Loud as the call is, to our shame be it remembered, we have no law to protect the lives of the King's subjects, from the mal-practice of pretenders. Any man, at his pleasure, sets up for physician, apothecary and chirurgion. No candidates are either examined or licensed, or were sworn to fair practice." †

The following picture of the state of physic in New-York in 1767, is given by a competent witness, Dr. Middleton. It is by no means flattering either to the public or to the profession.

"Yet many, too many, are the instances, even in this place, of men, otherwise valuable for their penetration and good sense, who have given up their own judgments to the opinions of the credulous vulgar; and joining in the belief of *nostrums*, or *secret cures*, have countenanced, and even employed the most obscure and superficial traders in physic. While the practitioner of modesty and real merit, conscious of his own integrity and knowledge, and scorning the lit-

* A Summary, historical and political, of the first planting, profession, improvements, and present state of the British Settlements in North America. By William Douglass, M. D. Boston. V. 2, p. 352.

† "The necessity of regulating the practice of physic, and a plan for that purpose, were strongly recommended by the authors of the Independent Reflector, in 1763, when the city of New-York alone boasted the honor of having above forty gentlemen of that faculty." History of New-York from the first discovery to the year 1732. By William Smith, A. M., p. 326.

the arts of such licensed freebooters and secret homicides, or to stoop to the unreasonable humors or petulance of every employer, has often had very circumscribed practice; or has been abandoned in favor of some ignorant or mercenary sycophant. This conduct in such men will ever discourage genuine worth, and the prospect of farther discoveries in that useful profession; which in all times, and among all polite nations, has ever been esteemed honorable, and worthy of men of the first rank and learning.

“Such being the state of physic here, what wonder is it that this city should be pestered in so remarkable a manner with the needy outcasts of other places, in the character of doctors; or that this profession, of all others, should be the receptacle and resource for the refuse of every other trade and employment? The wonder indeed is, that we should be such dupes to their effrontery as to employ them, or buy their pernicious compositions; not that they should frequent so beneficial a market. So amazingly easy of belief are some people in these miracle-mongers, that, as if there was something creative in the name of Doctor, seldom any other test of their skill is required than their assuming that title; so that this appellation, with a competent presence of mind and a string of ready-coined cures, carefully propagated by such as find their account in carrying on the cheat, have seldom failed of procuring traffic in New-York.” *

Virginia too seems to have been overrun with empirics, who by their inordinate charges annoyed the inhabitants of the Colony so much that the General Assembly passed various acts in 1639, 1661 and 1736, regulating the fees they should receive. In doing this the Assembly made a just distinction between the ordinary practitioners and those who had received a regular education, and had received a diploma from some university.†

* A Medical Discourse, or an Historical Inquiry into the Ancient and Present State of Medicine; the substance of which was delivered at the opening of the Medical School in the city of New-York. By PETER MIDDLETON, M. D., and Professor of the Theory of Physic in King's College.

† Est quoddam prodire tenet.—Hox.

‡ Curentur dubii medicis majoribus ægri.—Juv.

Printed by desire. New York: Printed by Hugh Gaine, in Hanover Square, 1769. pp. 63, 4.

† See Appendix, D.

That in a state of society where the means of medical education were so scanty, and where no laws existed to regulate the profession or restrain admission into ranks, quackery should be very rife, is certainly by no means singular. It would be unjust, however, to suppose that it is peculiar to such a state of society, or even that it prevailed to a greater extent than it does in the present day. Mortifying as it is, it is, nevertheless a fact, that it is peculiar to no particular age, or country, or state of society. It has existed from the earliest periods, and will continue to exist as long as human beings are found upon the face of the earth. The rude savage and the polished citizen are equally its victims, and civilization and refinement only render its forms more complicated and insidious. At no period in the history of this country, it may safely be asserted, has empiricism flourished to the same fearful extent as at the present time, notwithstanding our boasted improvements in other respects. Assuming a thousand different disguises, it is in many high places in our country, sapping the very honor of the profession, and corrupting it to the core. Notwithstanding the prevalence of quackery in the colonies, it does not appear that the well educated part of the profession lent it any countenance, and it would be well if the same could be said in the present day. A recollection of these facts should therefore moderate somewhat the severity of our judgment in relation to the state of our colonial medicine, at the same time that it should excite us to renewed diligence in endeavoring, if possible, to correct existing abuses.

MEDICAL LITERATURE.

I come next to take a brief notice of the state of medical literature previous to the revolution. Although not abounding in materials of very high interest or importance, the medical literature of this period is by no means contemptible. In forming a judgment in relation to it, we should recollect the circumstances in which the American physician was placed, and the slender inducements which were held out to undertake the labors of authorship. The two great motives which induce men, in any age, to write—the love of literary distinction, and the hope of pecuniary gain, then exercised but a feeble and limited influence; and accordingly, the colonial physicians only turned authors on some special emergency of public duty, or for the purpose of promulgating and enforcing some new and useful mode of practice. The capabilities of our early physicians, there-

fore, ought to be judged of, not so much by the quantity, as by the quality, of the productions which they have left us, and an impartial review of them will show us that they do not suffer by a comparison with the productions of their European brethren at the same period. Some of them were not thought unworthy of being published in the Transactions of the Royal Society, while others found a place in the publications of the learned medical associations of the day, in the mother country.

A brief review of what appeared in the colonies, will be, not merely interesting, as a matter of historical record, but will furnish the best evidence of the general drift and progress of medical mind during this period.

The earliest medical publications appeared in *Massachusetts*, and were called forth by the prevalence of epidemic diseases, and the first appears to have been a tract by Thomas Thatcher, a clergyman and physician of Massachusetts. It was entitled "A Brief Guide in the Small Pox and Measles," and was published in the year 1677. Cotton Mather, in his *Magnalia*, gives the life of this person, and represents him as a man of learning and ingenuity.*

In 1721, *Benjamin Colman*, a minister of Boston, printed a small pamphlet entitled—"Some Account of the New Method of Receiving the Small Pox, by Ingrafting or Inoculating;" in which he defends the practice of inoculation, which had just been introduced by Dr. Boylston.

Five years after this, Dr. *Boylston*, while on his visit to England, published there, at the request of the Royal Society, "An Historical Account of the Small Pox, inoculated in New-England." In the following year it was reprinted in Boston.

In addition to the above may be mentioned the names of Thomas Howard and Nathaniel Williams, both of whom were clergymen as well as physicians. The former wrote a *Treatise on Pharmacy*, in

* He was born in England in 1620, and came to this country in 1635. He was a man of great learning, especially in the oriental languages. He published a Hebrew Lexicon, and was skilled in the Arabic. According to Dr. Mather, he was a "great logician; he understood mechanism in theory and practice, and would make all kinds of clock work to admiration." He was eminent, not merely as a divine, but as a physician, and served in both capacities, first at Weymouth and then in Boston. See *Thatcher's Medical Biography*.

1732 ; and the latter a pamphlet "On the Method of Practice in the Small Pox in 1730."

The most voluminous writer, however, who appeared at this period, was Dr. *William Douglass*. He was a native of Scotland, and emigrated to New England about the year 1716. Although a man of talent and learning, he appears to have been of an unhappy temper of mind, to which he gave loose in many of his writings.* He was a most virulent opponent of the practice of inoculation, and did all in his power to excite popular indignation against it. Besides several publications on this subject, he has left a tract on the putrid sore throat distemper, which prevailed epidemically for several years in the colonies.† As this paper contains the only full account of a disease which attracted more than any other, the attention of our colonial physicians, it is worthy of a brief analysis. It furnishes the best description extant of the disease, and at the same time gives a good practical illustration of the views of practice at that period. The first appearance of the disease, was on the 20th of May, 1735, at Kingston an inland town of New England, about 50 miles eastward of Boston. It was vulgarly called the "*throat illness, or a plague in the throat.*" It was here that the disease displayed itself in its greatest malignity, according to Dr. Douglass. "Some died of a sudden or acute necrosis ; but most of them by a symptomatick affection of the fauces or neck ; that is by sphacelations or corrosive ulcerations in the fauces, or by an infiltration and tumefaction in the chops and fore part of the neck, so turgid, as to bring all upon a level between the chin and sternum, occasioning a strangulation of the patient in a short time." Its first appearance in Boston was on the 20th of August. Its general character here was however much milder than in the country. In Boston, Dr. Douglass estimates the whole number attacked with the disease about 4,000, which was about one fourth of the population, and of those attacked about 1 in 35 died.

* He is represented to have "been deficient in judgment, prudence and correct taste, he assumed the task of animadverting upon the actions and character of others, filling the newspapers with political essays, fraught with sarcastic remarks upon the magistrates, the clergy, the physicians and the people of New England." *American Medical Biography &c.*, by James Thacher, M. D. p. 255.

† The practical history of a new epidemical eruptive miliary fever, with an angina ulcusculosa, which prevailed in New England in 1735 and '36, by WILLIAM DOUGLASS, M. D., Boston 1736. Reprinted in the *New England Journal of Medicine and Surgery*, vol. 14, p. 1.

In the country towns, on the contrary, one in three of the sick, in others one in four, and in scarce any fewer than one in six died. The disease assumed various forms. Generally speaking in most of the patients, along with the common symptoms of fever, such as chill, pains in various parts of the body, nausea or vomiting, the uvula and tonsils became inflamed, tumefied with white specks upon them, together with a general efflorescence, beginning in the face and spreading over the neck, chest and extremities. On the 3d or 4th day this efflorescence reached its height, after which it terminated in a general itching and scaling off of the cuticle, and at the same time the specks and sloughs in the throat were thrown off. Cases of this description, he says, if left to nature with a "warm soft regimen, had generally an easy and salutary course in six or seven days." If on the contrary they were interfered with either by a stimulating or depleting practice they were protracted or ended badly; when the case assumed a bad character, there was great prostration of strength, despondency of mind, low pulse, incessant vomitings, purgings and sweats, excessive inflammation of the tonsils producing almost strangulation, with brown or livid specks in the fauces—ichorous discharges from the mouth and nose, sometimes stupor &c. In these cases the eruption on the skin was livid, alternately appearing and receding. Many of those affected in this way, died on the sixth or seventh day.

In the worst kind of cases the disease assumed a still more malignant character. The patients were generally seized suddenly; there was a sinking pain at the stomach, extreme prostration of strength, low pulse; in some, stupor, in others, delirium; in children, convulsions; colliquative vomiting, purging and sweats, with rapid decomposition after death. These cases terminated fatally on the first, second, or third day, and as Dr. Douglass expresses it, "by an irremediable necrosis of the œconomy." Venesection, and other evacuations, only accelerated death in these cases. In the treatment of the disease, Dr. Douglas shows much judgment and discrimination. In the ordinary form of it he trusted very much to nature. "In the standard kind," says he, "when left to nature, with a warm, soft regimen, it had generally an easy and salutary course in six or seven days; but when by a hot, cordial method—or on the other extreme, by being too much exposed to the cold, or by officious, profuse evacuations, nature was disturbed in her work—the distemper was pro-

tracted, or some consequential ails from an imperfect defecation ensued."

When nature required any assistance, the remedy chiefly relied on was *calomel*. As this was a practice, at that time perfectly original, it may not be uninteresting to the reader to be made acquainted with the reasons which led to the use of this remedy. In explaining his views on this subject, Dr. Douglas says, "any affection of the throat does frequently produce a natural ptyalism; mercurials used with discretion are a kind of specific in such like ulcers, or ulcuscula, and in fact, here they moistened the throat and mouth, stopt the spreading of the ulcuscula and promoted the casting off of the sloughs; and as an accessory advantage, (the patients being mostly children,) destroyed worms: amongst all its preparations *calomel* answered best; the gentle vomiting or few stools that it occasioned in some, did not confound the natural course of the distemper. *Turbeth* proves, generally, too strong a revulsion, and the eruption is thereby too much diverted; this distemper did not well bear any other evacuations but *mercurials*." And in another place he adds, "The despumation of this acrid iniquation of the juices in our distemper, that is, its natural crisis, seems to be by the potent and salutary emunctories of the fauces and skin. In corrosive taints, v. g. venereal and others, a mercurial ptyalism and sudorific decoction of the woods answer best; this gave us the hint of promoting the tendency of nature, in our illness, by *mercurials* and gentle-breathing sweats a-bed; which with good management, seldom failed, excepting where the necrosis was irremediable from the beginning." Blood-letting, except occasionally, he condemns as exceedingly injurious. "If the fever is too high, (which however was very seldom the case,) if the patient is plethoric, or accustomed to venesection," he directs "some blood to be taken, but with discretion; if the tonsils were much inflamed, with great pain and difficulty in swallowing," he advises the jugulars to be opened. On the other hand, the hot, cordial treatment he equally condemns. In cases of great prostration of the powers of life he recommends "generous wine," and other stimulants. As a local application, to cleanse the throat and separate the slough, he advises a gargle of the tincture of aloes and myrrh. Profuse sweats and diarrhoea were checked by elix. vitriol and toasted rhubarb. In the conclusion of this essay Dr. Douglass makes some general remarks of an

interesting character. Among others, he expresses the opinion that the disease was a new epidemic, not known before; that it did not depend upon any change of the seasons, as it prevailed during the whole of the year; that it did not depend upon any peculiarity of soil or climate, as it prevailed throughout the whole extent of the Colonies, from Massachusetts to South Carolina. He remarks, however, that "in damp places, as near large ponds, fresh-water rivers, woodlands and the like, it did the most execution." In addition to this he says it was not personally infectious, like the small-pox, &c., but that it "proceeded from some undiscovered quality of the air, affecting only peculiar constitutions of persons and families." No second attacks were observed, and no condition was exempt. "Europeans, West Indians, Indians, negroes, of all ages, were equally subject to it; but, as in most epidemical diseases, it affected children and the younger persons more generally." With regard to the treatment, he makes the significant remark, that "*most of those who died of the physician died by immoderate evacuations.*"

The preceding is an imperfect analysis as the paper of Dr. Douglass. Although written in a quaint style, it is a most remarkable production. There can be no question that the disease described by him was the same as the scarlatina of the present day, presenting itself in the principal varieties of the simple, anginose and malignant. These he describes very accurately, and he seems to have thoroughly understood the disease in all its forms and peculiarities. His views of the treatment too, are in the main excellent, and correspond with the most enlightened experience of the present day. Confident with regard to the merits of his paper, he closes his essay with the following prophetic words. "This is a real history of the distemper as it appeared in Boston, New England, taken clinically from the life and not copied. There is no shock or clause, but what I can vouch by real, not imaginary causes. It is founded only upon observations or phenomena that is upon the symptoms that appeared in the course of this epidemical disease; *it must therefore be of permanent truth.*"

The most elaborate work, of this author, was "A Summary, Historical and Political, of the First Planting, Progressive Improvements, and Present State of the British Settlements in North America." This was published in 1760, in two volumes, 8vo., and contains some amusing notices of the state of the profession in the colonies.

These were pretty much all the medical writers of whom Massachusetts could boast for upwards of a century and a half.

In the middle and southern colonies, medicine appears to have been cultivated with much more success than in the eastern. This may be accounted for by the fact that the former enjoyed the services of several foreign physicians, who had early emigrated thither, enriched by the best medical education which Europe could afford. It appears also to have been more common with them to send their young men to foreign universities to complete their medical studies. In addition to all this, a taste for researches in natural history began to develop itself much sooner in some of the southern colonies, and doubtless produced a salutary effect in spreading the influence of liberal sentiments. To these causes is to be attributed the early superiority of the southern colonies more especially.

Of the colonial physicians none were more active or distinguished than those of *South Carolina*. In 1734, a native of this state, *William Bull*, obtained a degree in medicine, at the university of Leyden, and on that occasion, defended and published an inaugural dissertation, "*De Colica Pictonum*." He had studied under Boerhaave, and seems to have commanded the respect of his associates. By the celebrated Van Swieten, he is spoken of in his commentaries as the *very learned W. Bull*.^{*} In 1749 *John Moultrie* received the degree of doctor in medicine, at the university of Edinburgh, and published a thesis, "*De Febre Flava*." He was the first native Carolinian who obtained this honor at that university. According to Dr. Ramsay, ten other native Carolinians obtained the same honor, between the years 1768 and '78†. As more particularly distinguished in this section of the country, the names of Drs. *Lining*, *Chalmers* and *Garden*, deserves to be especially noticed. They were all natives of Scotland, and emigrated in the earlier part of the last century. Being men of unquestioned abilities, learning and enterprise, they contributed greatly, both by their influence and writings, to el-

^{*} *Hæc colica in regionibus Americæ meridionalibus tam frequens est, ut fere pro morbo endemio haberi possit; uti ab Eruditissimo viro Gulielmo Bull, in his oris nato, et, nunc feliciter ibi medicinam exercente, sæpius audivi, qui et pulchram de hoc morbo scripsit dissertationem inauguralem, quam de academia Lugduno Batava defendit anno 1734. Van Swieten's Commentaries, vol. iiii. p. 357.*

† Ramsay's Review of Medicine in the 18th century. New-York Medical Repository, vol. iv. p. 396.

evate the character of the profession. To Dr. *John Lining*, we are indebted for some of the most valuable statical experiments ever published. They were continued throughout the whole of the year 1740. He ascertained his weight in the morning and evening; the weight of the food which he swallowed, and the weight of the urine and alvine excretions ejected. The result of these troublesome experiments was published in 1743, in the Transactions of the Royal Society of London.* In 1753 he published "A description of the American Yellow Fever," in a letter to the celebrated Dr. Robert Whytt, professor of medicine in the university of Edinburgh. This was the first account of this terrible disorder which had emanated from this continent, and stands to this day unrivalled for the general accuracy and minuteness of its description.†

To Dr. *Lionel Chalmers* we are also indebted for several valuable productions. In the year 1754 he communicated to the Medical Observations and Inquiries of London, a paper on the *Opisthotonos* and *Tetanus*. These appear to have been very prevalent at that time, in Charlestown, and Dr. Chalmers seems to have had a large experience in them. The remedies which he principally recommends are, blood-letting in the commencement, the warm bath, the free use of opium, and emollient enemata.† In 1758, he published "An Essay on Fevers," in which he enters into an extensive discussion of the theory of febrile diseases, and proposes a new method of treating them. Contrary to the prevalent belief of the time, Dr. Chalmers endeavors to show that the cause of the fever is not to be sought for in the fluids, but in the solids, and he considers the immediate cause to be "a spasmodic constriction of the arteries and other muscular membranes." Whatever can give much pain or stimulate the nerves so as to cause them to excite such constrictions, he thinks may bring on fever. As an inevitable consequence of this spasm and constriction, irregular distributions of blood take place, producing engorgements of the different viscera, and to this irregular circulation are owing all the phe-

* Vol. xlii. p. 491. Thomson's History of the Royal Society, p. 129.

† A description of the *American Yellow Fever*, in a letter from Dr. JOHN LINING, Physician at Charleston in South Carolina, to Robert Whytt, Professor of Medicine in the University of Edinburgh, p. 28. Edinburgh Essays and Observations V. 2, p. 401.

† Vol. 1, page 87.

nomena of fever. Spasm of the extreme arteries and irregular distribution of the blood being the leading features of fever, he recommends two indications in the treatment. First, to relax the spasm—second, to relieve the internal fulness of the system; and the two agents he recommends for accomplishing these purposes are, sweating and purging. Such is a very brief account of his theory of fever, which he supports with much talent and learning. The whole work displays a compass of observation, and a power of theoretical discussion, which should have raised its author to a higher rank than he seems to hold in the lists of medical fame. To perfect originality the theory of Dr. Chalmers can lay no claim. The doctrine of spasm had been previously suggested by the celebrated Hoffman, from whom both Chalmers and Cullen doubtless borrowed it. Whether Chalmers was at all indebted to Cullen for any of his views on this subject, it is not easy to say, although it seems very improbable, the essay of Dr. Chalmers having appeared several years before the “First Lines” of Dr. Cullen were presented to the public. Besides this, Dr. Chalmers was the author of a most valuable work on the Climate and Diseases of South Carolina.* This production was the result of upwards of twenty years experience, and is worthy of especial notice, as being the first and only work we have which gives an account of the peculiar diseases of any of the colonies. It shows the author to have been a man of accurate observation—most excellent judgment and discriminating views, of the nature and treatment of disease. It fully merits a place along side of the works of Huxham and Cleghorn. The following description of Charlestown is interesting as having been written upwards of seventy years ago.

“The white inhabitants of this town may be about five thousand five hundred; but the mortality among them cannot be exactly determined at present, no register thereof having been kept for several years. Formerly when bills of mortality were annually printed, the inhabitants then being not quite four thousand, it appeared that one in thirty-seven died yearly, or about one out of each family in the space of seven years and a half.” “There are many more negroes than white people in this town and province; and those of African descent are as susceptible of all sorts of diseases as those of

* Account of the Weather and Diseases of South-Carolina. By LIONEL CHALMERS, M.D., of Charles-Town, South-Carolina. London, 1776. 2 vol. 8vo. pp. 222—224.

other color, if we except the *yellow or malignant fever* and *gout*. Besides, they are liable to particular complaints, which seem peculiar to negroes only. However, even blacks, who live in all respects, as we commonly do, are equally obnoxious to *gout* with white men. Births cannot be ascertained from the christenings; for children are not baptized the same year in which they are born. But it is certain they far exceed the deaths of the settled inhabitants.

The natives for the most part, rise above the middling stature, and they attain their full height sooner, than the people usually do in colder climates. In general, they are of a slender make, have pale complexions, thin, fair or brown hair, which afterwards changes to a chesnut or black color; but it seldom curls. They are forward in genius, and thought capable of receiving instruction earlier, than children in Britain commonly are; with respect to their character, they are exceedingly hospitable, and of a mild temper, which is yet not without a quick sensibility of any designed affront; but their passions soon subside. Few live sixty years; and the bald or hoary and wrinkled appearances of old age, often show themselves at the age of thirty years; or even earlier, more especially on those who dwell in the country.

The women are in full bloom between their sixteenth and twenty-fifth year; and they very generally are well featured and genteel in person. The menses commonly begin to flow between the twelfth and fourteenth year; and that discharge ceases at different periods, between the thirtieth and fiftieth year of their ages, according as constitutions vary." p. 36, 37, 8.

Of the diseases, which at that period were the most prevalent in Carolina, *gout* seems to have taken the lead. Dr. Chalmers makes the following statement on this subject. "I am persuaded, that for the number of people, the *gout* is more common in this province than in any other country, and it attacks very many in whom no hereditary taint can be traced; but youth, sprung from *gouty* parents, are sometimes seized with that disease before they are twelve years old. It is thought by some, that the reason why we are so much inclined to *arthritick* disorders, may in part be owing to the constant use that is made of by many of weak sour punch. Yet, though that sort of liquor is now much less in esteem amongst us than it former-

ly was, this disease is notwithstanding rather more frequent than before. But, in my opinion, it may with more probability be imputed to a bad digestion, from an *atonia* of the stomach; for that part is equally weakened with others, by the great and continued heat of our summer weather. It is indeed true, that the first English settlers of this country, suffered but little from the *gout*, though the climate must have been more sultry and damp at that time than it is at present; because, the land being now much cleared of trees and underwood, with which it was in a manner covered in those days, the *air* consequently has a freer passage through the inhabited parts of the province. But those people led a laborious life; had many hardships to encounter, and their diet was more plain and simple than that of their successors,"*

Dr. Chalmers also recorded and published an important series of metrological observations at Charlestown, continued for ten years, i. e., from 1750 to 1760.†

Dr. *Alexander Garden* was another distinguished physician of Charlestown at this period. From all the accounts which we have left of him, he appears to have been a man not merely thoroughly versed in his profession, but highly accomplished in literature and general science. He was much devoted to natural history; and the transactions of the Royal Society contain several of his papers on this department. As a proof of the high estimation in which he was held, it may be mentioned, that Linnæus, with whom he corresponded in Latin, gave the name of *Gardenia* (in honor of him) to "one of the most beautiful flowering shrubs in the world." He was a member of the Royal societies of Upsal and of London. The only medical production which he has left, is an account of the anthelmintic properties of the *Spigelia Marylandica*, together with a botanical description of the plant published in 1771.‡

This plant grows abundantly in the low rich lands of South Carolina, and for the first knowledge of its *anthelmintic virtues*, we are

* On the climate and diseases of South Carolina, vol. 2. p. 175, 6.

† A general table of the results of these observations may be seen in his work on Carolina, vol I. p. 42.

‡ An account of the Indian pink, by ALEX. GARDEN, M. D., in Charlestown, South Carolina, member of the Royal Society at Upsal, and of the Philorophical Society of Edinburgh, communicated in three letters 1764-65, and presented by Dr. Hope. Edinb. essays and observations, physical and literary, vol. 3, p. 145. For an interesting account of Dr. Garden, see Ramsay's History of South Carolina, vol. 2.

entirely indebted to the Cherokee Indians. According to Dr. Garden, the discovery was made by them about forty years previous to the time he wrote (1764.) It soon became known to the white inhabitants, and in a short time was used extensively in Charlestown and throughout Carolina. Besides Dr. Garden, Drs. Lining* and Chalmers give accounts of its efficacy and general use at the time. It is needless to say that it retains to this day the high reputation which it acquired eighty years ago. In connection with the early history of the Pink root before the properties of it were precisely understood, Dr. Chalmers records the case of two healthy children both in one family, one of seven and the other of five years of age, who died on the same day, from convulsions induced by its use.†

Virginia could also boast of some distinguished men in the profession; and among these especially were *Clayton* and *Mitchell*. Dr. *John Clayton* was of English origin, and came to Virginia about the year 1705.‡ He was particularly eminent as a botanist, and devoted a long life to the investigation of the plants of Virginia. As the result of his labors, he published in 1743 a *Flora Virginica*. It was afterwards republished by Gronovius at Leyden, in 1762.§ Besides this, he published in the Philosophical Transactions several papers in relation to the culture of the different varieties of tobacco, together with a full account of the medicinal plants of Virginia. The celebrated author of the Notes on Virginia, has left the following respectful testimony to the character of this eminent naturalist and physician: "This accurate observer was a native [incorrect] and resident of Virginia, passed a long life in exploring and describing its plants, and is supposed to have enlarged the botanical catalogue as much as almost any man who has lived."||

* Of the anthelmintic virtues of the Indian Pink, being part of a letter from Dr. JOHN LINING, physician at Charlestown in South Carolina, to Dr. ROBERT WHITT, Prof. of Medicine in the University of Edinburgh. Edinburgh Essays and observations, &c., vol. 1, p. 436. An account of the weather and diseases of South Carolina. Vol. 1, p. 66.

† On the weather and diseases of South Carolina. Vol. 1, p. 67.

‡ Thacher's Med. Biography, p. 224.

§ *Flora Virginica exhibens plantas quas nobilissimus vir D. D. Johannes Claytonus, Med. Doct. &c. in Virginia crescentes observavit, collegit et obtulit D. Joh. Fred. Gronovio, cujus studio et opera descriptas et in ordinem sexualem systematicum redactas sistuntur. Lugduni Batavorum 1762.*

|| Notes on Virginia, by Thomas Jefferson, p. 63.

Dr. *John Mitchell* was another Englishman who emigrated to Virginia about the beginning of the last century, and no less distinguished for his attainments in medicine and natural history. The productions by which his name has been handed down to posterity are, "An Essay on the causes of the different colors of people in different climates," and "Letters on the yellow fever of Virginia." The first of these is a production of no ordinary character. It was published in the *Philosophical Transactions* of 1743, and occupies about fifty pages. The first part of this paper is occupied with the consideration of the cause of the color of the skin generally, and he endeavors to establish the following propositions: 1. That the color of white people proceeds from the color which the epidermis transmits; that is, from the color of the parts under the epidermis, rather than from any color of its own: 2. That the skins of negroes are of a thicker substance and denser texture than those of white people, and transmit no color through them: 3. That the part of the skin which appears black in negroes, is the corpus reticulare cutis, and external lamella of the epidermis; and all other parts are of the same color in them with those of white people, except the fibres which pass between these two parts: 4. That the color of negroes does not proceed from any black humors or fluid parts contained in their skins, for there is none such in any part of their bodies, more than in white people: 5. The epidermis, especially its external lamella, is divided into two parts by its pores and scales, two hundred times less than the particles of bodies, on which their colors depend. Having established these propositions by a series of facts and reasonings, he comes to the conclusion that the proximate cause of the color of negroes is three-fold, viz: the opacity of their skins, proceeding from the thickness and density of their texture, which obstructs the transmission of the rays of light from the white and red parts below them; together with their greater refractive power which absorbs those rays, and the smallness of the particles of their skins, which hinder them from reflecting any light. The difference thus depending upon a difference in the texture of the skins, he next proceeds to show that the different colors of the human race can readily be explained by the effect of climate and the mode of life, in modifying the texture of the skin. He supports the scriptural doctrine of the common origin of man, and thinks the primitive color was a medium between white and black, "from which primitive color the Europeans degenerated as much on the one hand as the

Africans did on the other ; the Asiatics, unless, perhaps, where mixed with the whiter Europeans, with most of the Americans, retaining the primitive and original complexion.”* Such is a brief account of this most ingenious and elaborate paper. Any analysis of it, however, must do it injustice. To appreciate the philosophical acumen and learning which it displays, it ought to be read at full length.

Another paper by Dr. Mitchell is an account of the yellow fever which prevailed in Virginia in 1741, of which I have already had occasion to speak in a previous part of this discourse. This was not published at the time, but the manuscript fell into the hands of Dr. Franklin, by whom, a short time before his death, it was given to Dr. Rush. It has since been published in Coxe’s Medical Museum, and in the Medical and Philosophical Register of New-York.†

Another physician of Virginia, and a native, Dr. *John Tennent*, deserves to be mentioned, as having written the first account of that valuable medicine, the *Polygala Seneca*. He appears to have been a connection of the celebrated Dr. Richard Mead, of London, and it was to him, that he communicated the first information on this subject.‡ The account which he gives is not without its interest. It seems that the plant had long been used by the Seneca tribe of Indians as a specific in cases of poisoning by the bite of a rattlesnake. They had inferred this from a supposed resemblance between the root of the plant and the rattle of the snake. Dr. Tennent had seen cases of this kind successfully treated by it, and from the analogy in the symptoms and those of peripneumony and pleurisy, he was led to try it in those diseases, and, as he relates, with great success. When the disease was of the acute inflammatory character he practised blood-letting. When it was of the nervous or bastard kind, or of long standing, he discarded not merely blood-letting, but blisters and all other remedies, and trusted exclusively to the snake-root, which he affirmed “scarce ever failed to make a cure, and that in some desperate cases.” He also recommends it in rheumatism, dropsy and gout. He used it both in powder and decoction—the

* See the Abridgment of the Philosophical Transactions, by Drs. Hutton, Shaw and Pearson, vol. 9, p. 50.

† Two letters, vol. 4, pp. 183, 383.

‡ An Epistle to Dr. Mead concerning the Seneca Rattle-snake Root, by JOHN TENNENT. 8vo. Edinburgh, 1738. See Edinburgh Medical Essays and Observations, vol. 6, page 376.

latter however, be preferred. This was prepared by boiling 3 iij. of the bruised root in a quart of water to near the half. Of this three spoonful were given every six hours. Of the powder the dose was 35 grs. The effects, he says, are diuretic, diaphoretic, cathartic, and sometimes emetic. The virtues of the polygala had no sooner been promulgated in Europe, than they were tested and confirmed by Bouvart and several other French physicians. It is worthy of remark, that although the efficiency of it against the bite of the rattlesnake has proved fanciful, yet its reputation as a valuable adjuvant in certain forms of pulmonary disease has been retained to the present day. For the subsequent application of it too, as a remedy in croup, we are indebted to an American physician, Dr. *Archer*, of Maryland. By him it was originally recommended in this disease in the year 1806. To American physicians, are we thus indebted for almost all our knowledge of this valuable plant.

Among the medical men of Pennsylvania, there are several who are entitled to notice, as having contributed to the colonial literature of our profession. In 1740, Dr. *Thomas Cadwallader*, of Philadelphia, published "An Essay on the Illiac Passion," in which he exposes the absurdity of the practice then in vogue, viz: that of treating it by quicksilver and drastic purges. He recommends in their stead, mild cathartics, with the occasional use of opiates. † By Dr. *Thomas Bond*, an eminent physician of Philadelphia, two communications were published in the London Medical Observations and Inquiries, one an account of a worm bred in the liver, § 1754; another on the use of bark in scrofulous cases, 1759. || The men, however, who were particularly distinguished, in Philadelphia, for their zeal in the cause of medical science, were Drs. *John Morgan* and *William Shippen*, both natives of that place, and the founders of the first medical school established in this country. Dr. Morgan, after studying medicine at home, went to Edinburgh, where he received the doctor's degree, on which occasion he published an elaborate thesis on the formation of pus—"Tentamen Medicum de Puris Confectione, Edinburgh, 1763." In this dissertation he maintained the doctrine that *pus is a secretion*, prepared by a peculiar action of the secretory ves-

† *Miller's Retrospect of the Eighteenth Century*, vol. I. p. 317.

§ Vol. 1, p. 68.

|| Vol. 2, p. 265.

sels of the part. The credit of originality, as it regards this doctrine, has generally been awarded to the celebrated John Hunter. The evidence, however, appears to be conclusive, that he was anticipated by Dr. Morgan.* After receiving his degree at Edinburgh, he travelled for some time on the continent, industriously engaged in acquiring knowledge, and everywhere received with the highest honor. As a proof of the estimation in which he was held abroad, it is only necessary to state, that on his return home, in 1765, he was a fellow of the Royal Society of London, corresponding member of the Royal Academy of Surgery of Paris, and licentiate of the Royal Colleges of Physicians of London and Edinburgh. Notwithstanding his devotion to science, Dr. Morgan was not a prolific author. Besides his Thesis, all that we have left is his "Discourse," already noticed, "On the Institution of Medical Schools in America," in 1765, and "A Recommendation of Inoculation, According to Baron Dimsdale's Method," 1776.

Dr. Shippen was born in 1736, and about the year 1760 took his degree at Edinburgh, on which occasion he wrote and published a thesis, "De Placentæ Cum Utero Nexu." Besides this I do not know that he published anything, but he is greatly and justly celebrated as the first professor of anatomy in this country.†

Last, though not least, the contributions of the eminent men who adorned our profession in *New-York* require to be briefly commemorated. Among these, the first place is unquestionably due to *Cadwallader Colden*. He was a native of Scotland, and received his education at the university of Edinburgh. In 1718, he settled in New-

* See Cullen's *First Lines*, edited by Prof. Charles Caldwell, vol. i. p. 225, note by Prof. Caldwell. Dr. James Curry, lecturer at Guy's Hospital, also gives the credit of priority to Dr. Morgan, and he adds: "I could not avoid giving that merit to Dr. Morgan, who discussed the question with great ingenuity, in his *Inaugural Dissertation*, on taking his degree at Edinburgh in 1763; whilst I could find no proof that Mr. Hunter had taught, or even adopted such an opinion, until a considerably later period." See *London Med. and Phys. Journal* for 1817; also, *New-England Journal of Med. and Surg.*, vol. vi., p. 404.

† This was in 1765. A few years before this, anatomical lectures were delivered (that is, in the years 1754-5-6) at Newport, Rhode Island by *William Hunter*, M. D. Dr. Hunter was born in Scotland and was a relative of the celebrated Drs. Wm. and John Hunter. He was a graduate of the University of Edinburgh. He came to Rhode Island in the year 1752. According to Dr. Thacher, "advertisements of this Lecture may be seen in the Boston papers of that day." His manuscript Lectures are said to be still in existence. See *Thacher*.

York. He soon, however, relinquished the practice of physic, and became a public character holding in succession the offices of surveyor general of the province, member of the council, and finally lieutenant governor. Although thus withdrawn from the profession, he did not lose his fondness for medical and philosophical pursuits.

Among his medical productions is an "Account of the Climate and diseases of New-York." This was published when he was surveyor general of the province, about the year 1720. It is an exceedingly interesting paper, giving as it does the only account we have of the climate and diseases of this city, at so early a period. In relation to consumption, now so fatally prevalent, he makes the following interesting remarks: "the air of the country being almost always clear, and its spring strong, we have few consumptions, or diseases of the lungs. People inclined to be consumptive in England, are often perfectly cured by our fine air, but if there be ulcers formed, they die in a little time."* He concludes his paper by saying that "the climate grows every day better as the country is cleared of the woods, and more healthy, as all the people that have long lived here testify. This has even been sensible to me, though I have been but twelve years in the country. I therefore doubt not but it will in time become one of the most agreeable and healthy climates on the face of the earth. As it is at present, I prefer it to the climate of England, and I believe most people that have lived any considerable time here, and are returned to England, will confirm this."† He also wrote "observations on the Fever which prevailed in the city of New-York in 1741-2," in which he made a number of valuable suggestions in relation to draining and purification, with the view of preventing the recurrence of the disease.‡ For this the corporation of the city presented him their thanks, and a plan for draining and cleaning the city was established, which was attended with the most salutary effects." Besides these, he published a treatise "On the cure of cancer;" and another "on the virtues of the great water dock," which is said to have "introduced him to an acquaintance with Linnæus. In 1753 he addressed a letter to Dr. Fothergill of London, giving an account of the

* Medical and Philosophical Register of New-York, vol. i. p. 310.

† Medical and Philosophical Register of New-York, vol. i. p. 310.

‡ *Ib.* vol. i. p. 324.

throat distemper, which had been previously described by Dr. Douglass. This was published in the *London Medical Observations and Enquiries*.* In this letter he gives a brief account of the progress of the disease after its first appearance at Kingston, in New Hampshire in the year 1735. From thence he says "it spread westward, but so gradually, that nearly two years elapsed before it reached the Hudson river where Dr. Colden resided. For some time it continued on the east side of the river; it then passed to the west and made its appearance first in those places to which the people of New England chiefly resorted for trade, and in places through which they travelled. From thence it continued to proceed westerly, till finally it spread all over the British colonies. He then proceeds to give an account of the symptoms and treatment of the disease, which is chiefly interesting as confirming the account previously given of it by Dr. Douglass of Boston. He acknowledges his indebtedness to him in the following terms. "What I chiefly learned, was from the late Dr. Douglass of Boston, a gentleman of great skill in medicine, and an accurate observer, having corresponded with him while this distemper was frequent in the part of the country where I lived."†

Although Dr. Colden has thus left several interesting papers on medical subjects, his principal attention was directed to scientific and literary pursuits. Botany was a favorite study. He described between three and four hundred plants, which were afterwards printed in the *Acta Upsaliensa*. In honor of his daughter, who imbibed the ardor of her parent in this science, Linnæus named a plant of the tetrandrous class, that was first described by her, *Coldenia*. His "history of the Five Indian Nations," is a work of high interest and value, even at the present day.‡ He also published a work on the cause of gravitation. This was afterwards enlarged and republished in 1751, by Dodsley, in 1 vol. 4to., entitled, "The principles of action in Motion."

Altogether the name of Colden is one of the most distinguished in our colonial annals. He corresponded with the most distinguished men abroad, as well as those in this country and especially with Dr. Franklin. They appear to have been men of similar tastes and sympathies, and interchanged opinions continually on electricity, philosophy and other scientific subjects. Dr. Colden

* Vol. i. p. 211.

† *Medical Observations and Enquiries of London*, vol. 1. 211.

‡ *History of the Five Indian Nations of Canada*, 8vo. London 1747.

situation in which the colonies were then placed, this was a most acceptable present, both to the profession and to the public. It was so well received, that a second edition was called for the same year. Although a plain and unpretending work, it was admirably fitted to the purposes for which it was intended, and it shows the author to have been a man of strong sense, combined with a thorough knowledge of his subject. The motive which prompted him to this undertaking, is thus expressed in his dedication: "To Doctor Thomas Cadwalader, Physician, in Philadelphia."

"The present calamitous situation of this country, in a peculiar manner demands the aid and assistance of every virtuous citizen; and though few men are possessed of those superior talents which are requisite to heal such mighty evils as now threaten the whole body politic with ruin and desolation; yet, every man has it in his power to contribute something to so desirable an end; and if he cannot cure the fatal diseases of his country, it will at least afford him some consolation, to have poured a little balm into her bleeding wounds." p. 3.

The introduction to the work, addressed "to the students, and young practitioners of surgery, through all America," abounds in just sentiments, eminently valuable at the time they were published, and not unworthy of recollection at the present day. His ideas of the qualifications necessary to make a really good surgeon were by no means low. "The proper requisites of this respectable character," says he, "are only to be found in a liberal education, furnishing every means of acquiring that knowledge, which must be ripened by experience, and graced by the constant practice of attention, tenderness and humanity. A judicious surgeon will always find his powers and abilities of assisting the wretched proportionable to the time he has spent, and the pains he has bestowed in acquiring the proper knowledge of his profession," p. 6. He deprecates the separation of physic from surgery as injurious to both. "In most European countries," says he, "an invidious distinction has prevailed between physic and surgery, but in this part of the world the two professions are generally united; indeed both the branches of medicine are in the very nature of things, so intimately connected, as not to admit of absolute separation without manifest injury to each," p. 9. He concludes with the following remarks: "Surgery may, with great propriety,

be divided into medical and manual ;—the first comprehends an infinite variety of diseases, which require the assistance of both internal and external applications ;—the last is confined to those cases which admit of relief from the hand alone, or assisted with instruments.

Hence it will appear very evident how necessary it is for the student in surgery to make himself thoroughly acquainted with most of those branches of medicine which are requisite to form an accomplished physician.

Besides a competent acquaintance with the learned languages, which are to lay the foundation of every other acquisition ; he must possess an accurate knowledge of the structure of the human body, acquired not only by attending anatomical lectures, but by frequent dissections of dead bodies with his own hands. This practice cannot be too warmly recommended to students in surgery. It is from this source and a knowledge in hydraulics, they must derive any adequate notions of the animal economy or physiology. Chemistry and *Materia Medica* are very necessary to a right understanding of pharmacy or composition. To these should be added some progress in the mathematics and mechanics, which I will venture to assert, may be applied with much more utility and safety to the science of surgery than physic. But there must be a happiness, as well as art, to complete the character of the great surgeon.

He ought to have firm steady hands, and be able to use both alike ; a strong clear sight, and above all a mind calm and intrepid, yet humane and compassionate, avoiding every appearance of horror and cruelty to his patient, amid the most severe operations." p. 9, 10, 11.

From the foregoing it appears that Dr. Jones considered a liberal preliminary education "essential to form the good surgeon as well as the good physician," and the whole extract is exceedingly interesting, not merely as an evidence of the liberal views of the author, but as showing the high standard of professional excellence which was beginning to be enforced at that early day. The only other production on record of Dr. Jones is an interesting paper on "Anthrax," in the first part of volume 1, of the *Transactions of the College of Physicians of Philadelphia*.

Altogether, Dr. Jones has left behind him a most enviable reputation. He was the physician of Washington and Franklin, the latter of whom he attended in his last illness.* Not merely as the skilful operator, but as the scientific surgeon, and the first teacher of surgery in the colonies, he justly deserves to be styled the *father of American surgery*.

Among the medical men of New-York who commenced their career before the Revolution, Dr. *Samuel Bard* is not the least deserving of notice. Dr. Bard was born in 1742, and after having received a liberal education at King's (now Columbia) College, together with some preliminary instruction in medicine from his father, Dr. John Bard, he set sail for Europe in 1760, where he prosecuted his professional studies, partly in London, but principally in Edinburgh, where, after remaining three years, he graduated in 1765. While a student at Edinburgh, he distinguished himself as a botanist, and obtained the

* The following interesting account of the last moments of Franklin, written by Dr. Jones, was published at the time: "The stone, with which he had been afflicted for several years, had for the last twelve months of his life confined him chiefly to his bed; and during the extremely painful paroxysms, he was obliged to take large doses of laudanum to mitigate his tortures; still, in the intervals of pain, he not only amused himself by reading and conversing cheerfully with his family and a few friends who visited him, but was often employed in doing business of a public as well as of a private nature, with various persons who waited upon him for that purpose; and in every instance displayed not only the readiness and disposition to do good, which were the distinguished characteristics of his life, but the fullest and clearest possession of his uncommon abilities. He also not unfrequently indulged in those *jeux d'esprit*, and entertaining anecdotes, which were the delight of all who heard him.

"About sixteen days before his death, he was seized with a feverish disposition, without any particular symptoms attending it till the third or fourth day, when he complained of a pain in the left breast, which increased till it became extremely acute, attended by a cough and laborious breathing. During this state, when the severity of his pains drew forth a groan of complaint, he would observe that he was afraid he did not bear them as he ought; acknowledging his grateful sense of the many blessings he had received from the Supreme Being, who had raised him from small and low beginnings, to such high rank and consideration among men; and had no doubt but that his present afflictions were kindly intended to wean him from a world in which he was no longer fit to act the part assigned him. In this frame of body and mind he continued until five days before his death, when the pain and difficulty of breathing entirely left him, and his family were flattering themselves with the hopes of his recovery; but an imposthume which had formed in his lungs, suddenly burst, and discharged a quantity of matter which he continued to throw up while he had power, but as that failed, the organs of respiration became gradually oppressed; a calm lethargic state succeeded, and on the 17th day of April, 1790, about eleven o'clock at night, he quietly expired, closing a long and useful life of eighty-four years and three months." *Mease's Memoir*.

prize offered by Dr. Hope, professor of botany in the University of Edinburgh, for the best herbarium of indigenous plants growing within ten miles of Edinburgh.* On the occasion of his graduation he published an Inaugural Thesis on opium, in the latin language.† This is no mean production. Considering the period when this essay appeared, the age of the writer, and the manner in which the investigation with regard to the effects of opium was conducted, it shows the author to have been endowed with no ordinary powers. It attracted the notice of the celebrated Haller, and is also mentioned by Crumpe, in his valuable work on opium, with high commendation. At the period when Dr. Bard studied, the subject of opium was not so well understood as it is at present, and a great difference of opinion existed in relation to several points which Dr. Bard undertook to investigate. These were, the part of the system upon which opium primarily operated; whether its effects on the pulse were stimulant or sedative, and whether it increased or diminished animal heat. Dr. Bard contended that it acted primarily on the nervous system and not on the blood; that its action was uniformly sedative on the pulse, and that it lessened animal heat. With regard to the pulse, he performed a number of experiments upon himself as well as some of his friends, confirmatory of this opinion. The general conclusions to which he came in relation to the virtues of opium were the following: 1. That it produces hilarity of mind; 2. That it retards the action of the heart and arteries, and renders the pulse fuller; 3. That it diminishes animal heat; 4. That it lessens all the secretions with the exception of the perspiration, which it increases; 5. That it constipates the bowels; 6. That it sometimes suppresses the urine; 7. That it renders respiration slower; 8. That it causes a sense of fullness and stricture about the head and chest; 9. That it lessens pain, resolves spasm, recruits the body exhausted by labor, causes sleep, and sometimes produces itching of the skin.

After his graduation, he returned to New-York in his twenty-fourth year, and according to Dr. Mitchill, might be "considered as the

* This collection is yet in existence; at least it was so a few years since. Dr. Mitchill states that one of the volumes was in his possession, containing about one hundred plants; and after the lapse of fifty years was in good preservation. It was lettered, *E Plantis circa Edosam satte*.—Mitchill's Discourse, p. 13.

† *Tentamen Medicum Inaugurale, de viribus Opii*. Edin. 1765. pp. 49.

most accomplished young physician that New-York could then boast.”*

Dr. Bard had scarcely settled himself in New-York, before we find him engaged in two enterprises of great interest, both to the profession and the public—and these were the organization of a medical faculty and the establishment of a public hospital. In 1767, the Trustees of Kings’ College established a medical faculty, and it is an unequivocal proof of the high estimation in which Dr. Bard was held, when we find him appointed to one of the most important chairs, that of the Practice of Medicine, and more particularly so, when we find the men associated with him were not only much more advanced in years, but men of high professional standing. In this capacity Dr. Bard soon distinguished himself by an introductory which he delivered at the commencement in 1768, in which he advocated with so much zeal the necessity of a public hospital, that it led at once to the establishment of that noble institution, the *New-York Hospital*.

In 1771, Dr. Bard published an essay † on the sore-throat distemper, which was then prevalent in New-York, and which attracted much professional as well as general interest. This essay was first published in the Transactions of the American Philosophical Society, and communicated to John Morgan, M.D., F.R.S. Vol. 1, p. 388.

This is the least satisfactory of all the productions of Dr. Bard. The late Dr. Mitchill says of it, “the disease he describes has puzzled the physicians who have read his publication. For Cullen, the acute nosologist, places it in the list of works on the cynanche maligna; while Albers, the successful competitor for the Buonapartean medal, quotes it as a treatise on cynanche trachealis. The former classes it with the writings on the malignant or ulcerous sore throat, while the latter ranks it with the publications on croup or trachealis

* A Discourse on the Life and Character of Samuel Bard, M.D., &c., by SAMUEL S. MITCHILL, M.D., LL.D., p. 17.

† “An Enquiry into the nature, cause and cure of the Angina Suffocativa, or sore-throat distemper, as it is commonly called, by the inhabitants of this city and colony.” By SAMUEL BARD, M.D., and Professor of the Practice of Physic, in Kings’ College, New-York. Is certe curaturus quem prima origo causæ non (efellerit). Celsus. New York, 1771. Dedicated to Cad. Colden, Lieut. Gov. of the Province, page 33.

infantum."* The truth is, that at the time Dr. Bard wrote, no accurate discrimination was made between the two diseases, and as both the sore-throat disease and the croup prevailed at this time in New-York, it was not singular that they were generally confounded with each other. Dr. Bard fell into the common mistake on this subject, as is apparent from his essay. He says, "I am led to conclude that the disease called by the Italians *Morbus Strangulatorius*, the *Croup* of Dr. Home, the *sore-throat* of Huxham and Fothergill, this *disease* and *that* described by Dr. Douglass, of Boston, however they may differ in the symptoms of putrescency and malignancy, do all bear an essential affinity and relation to each other—are apt to run into one another, and in fact arise from the same fever," &c. page 19. In his essay, accordingly, Dr. Bard mentions symptoms peculiar to both diseases; and also recommends a treatment fully suited to the one and partly to the other.

The remainder of the history of Dr. Bard's life belongs to a period not embraced in the present sketch. In 1811 he was appointed President of the College of Physicians and Surgeons of New-York, a place he filled with grace and dignity. He also published a work on *obstetrics*, with several other minor productions. Finally, in 1821, at the age of seventy-nine, he closed his useful life, full of years and full of honor, with the dignified composure and the firm hope of a christian.

Before closing this account of our colonial medical literature, it would be unjust not to notice the Transactions of a Society, which contributed in no small degree to raise the scientific character of the country. I mean, the American Philosophical Society.† The first volume of their proceedings was published anterior to the revolution, (1771) and contains some papers on important medical subjects. It may be stated, too, that four American physicians were elected fellows

* A Discourse on the Life and Character of Samuel Bard, M.D., LL D., &c., by SAMUEL L. MITCHILL, M.D., &c., p. 21: New-York, 1821.

† This Society was organized in the year 1744. An interesting letter from Dr. Franklin to Dr. Colden, dated April 5, 1774, gives an account of the original members comprising the Society. They were the following, viz: Fr. Thomas Bond, as physician, Mr. John Bartram as botanist, Mr. Thomas Godfrey, as mathematician, Mr. Samuel Rhodes as mechanician, Mr. William Parsons as Geographer, Dr. Phineas Bond as general natural philosopher, Mr. Thomas Hopkinson, President, Mr. William Coleman Treasurer, Benjamin Franklin Secretary. See *American Medical and Philosophical Register*, vol. II, p. 203, for the letter itself as well as a fac-simile.

of the Royal Society of London, before the Revolution. These were Drs. Boylston, Mitchell (of Virginia), Garden, and Morgan. Besides these there were ten other Americans who had been raised to the same honor, viz: four of the name of Winthrop, Paul Dudley, President Leverett, Thomas Brattle, Cotton Mather, Benjamin Franklin, and David Rittenhouse.*

No medical journal of any description appears to have been published until after the war of our independence, and the only inaugural dissertation that was published was from the New-York college in 1771, by Samuel Kissam, M. D., on the Anthelmintic Virtue of the *Phaseolus Zuratensis Siliqua Hirsuta*, or Cow-Itch, a copy of which may be seen in the library of the New-York Historical Society.

MEDICAL EDUCATION AND INSTITUTIONS.

Under this head may be embraced all those acts and establishments of the colonial governments, whose object was the preservation of the public health, as well as those institutions of a public nature, which originated from the combination of individual enterprise and liberality.

From the commercial character of the country, it may readily be supposed, that our first medical establishments were lazarettos, or hospitals intended for the reception of seamen and others infected with contagious disorders. Accordingly we find a hospital of this description established by Massachusetts, nearly one hundred and fifty years ago, at Rainsford island, in the harbor of Boston. Another was at an early period erected on State island in the Delaware, and appropriated to similar purposes for the port of Philadelphia. After the practice of inoculation had become settled, hospitals were gradually established in different parts of the country, for the purpose of carrying patients through this process. Several of this description were in existence shortly after the middle of the last century. These were, however, entirely the result of private enterprise, without any legislative aid, and were therefore, only of temporary duration. Among the physicians who devoted themselves to this kind of business, Dr. Barnet of New Jersey seems to have been the most conspicuous. So common had these establishments become, that laws

* Ramsay's America, vol. i. p. 271.

in relation to them were passed by the authorities in several of the colonies.*

Useful as the foregoing institutions undoubtedly were, they could not have produced any effect of consequence upon the existing state of medical science. In 1750, a project of a higher order was set on foot in Philadelphia; this was the establishment of a hospital, upon the plan and embracing all the advantages of the European hospitals, and the individual with whom it originated was Dr. Thomas Bond. No sooner was the object proposed to the citizens of Philadelphia, than measures were adopted to carry it into execution. For that purpose, a petition was presented to the Assembly of the colony soliciting the aid of that body, the result of which was a grant of £2000, on condition that an equal sum should be raised by subscription. The proposed amount was speedily raised; and early in the year 1752, patients were admitted into a building which had been procured for their temporary accommodation. The erection of the present building was not commenced until 1755. In the year 1769, a similar project was started in New-York, and the credit of first suggesting it is due to the late *Dr. Samuel Bard*. In consequence of a public discourse delivered by him, a general interest was excited in the measure.† The liberal contributions of the governor of the province, (Sir Henry Moore,) the corporation of the city, and the legislature of the province, enabled the governors to commence the erection of the building in 1773. After being nearly completed, it accidentally took fire, and was nearly consumed, in 1775. The present building was not completed until 1791, when it was opened.

* See appendix E:

† The agency of Dr. Bard is mentioned in the following terms by Dr. Middleton, in his discourse delivered 1769. "The necessity and usefulness of a public infirmary, has been so warmly and pathetically set forth in a discourse delivered by Dr. Samuel Bard, at the commencement in May last, that his Excellency Sir Henry Moore immediately set on foot a subscription for that purpose, to which himself and most of the gentlemen present liberally contributed. His Excellency also recommended it, in the most pressing manner, to the Assembly of the province, as an object worthy of their attention; and the corporation of the city have given assurance of granting a very valuable and commodious lot of ground for erecting the building upon; so that there is now almost a certain prospect of this benevolent and humane foundation soon taking place; and as it is to be on the most catholic and unexceptionable plan, it is to be hoped that it will meet with the countenance and encouragement of every compassionate and good member of society, whatever party or denomination he may choose to be distinguished by on other occasions." Note p. 60.

for the reception of patients.* These were all the hospitals that were attempted anterior to the revolution.

Among the most singular features connected with the history of our colonial medicine, is the fact that so little attention was paid to professional education. This is the more remarkable, inasmuch as our colonial ancestors were fully alive to the importance of general instruction, and the most honorable efforts were made to establish it on a respectable foundation. So early as the year 1638, Harvard University, in Massachusetts, was founded. In 1691, William and Mary College, in Virginia; in 1700, Yale College, in Connecticut; and in 1746, Princeton College, in New Jersey, were severally established; yet in none of them was any provision made for instruction in medical science. With the single exception, too, of New-York, already noticed, and that so late as 1760, the law imposed no qualifications upon those who entered the profession, nor were they subjected to any examinations. The education of physicians, therefore, at this period, restricted as it was to the personal instruction of those with whom they studied, must have been limited indeed. The only mode of supplying this deficiency, was by resorting to foreign countries; and it appears that almost all the distinguished physicians who flourished anterior to the revolution, had received their education in Europe. It is a fact certainly highly honorable and worthy of record, that Harvard College no sooner began to send forth her graduates, than some of them found their way to foreign universities, where they obtained the degree of doctor of medicine. In 1642, Samuel Bellingham graduated at the first commencement at Harvard, and shortly afterwards obtained a doctor's degree at Leyden. In 1650, John Glover and Leonard Hoar left the college, and were afterwards honored with the doctorate abroad, the former at Aberdeen, the latter at Cambridge in England. Hoar afterwards became president of Harvard college. In 1674, Edmund Davie graduated, and subsequently was made an M. D. at Padua.† As may be supposed, this practice became more and more common, till the period of the revolution; and this, together with the number of foreign physicians of talent and education who emigrated to this country, tended, in no inconsi-

* An account of the New-York Hospital, 1811.

† See the catalogue of the graduates of Harvard College.

derable degree, to correct the deficiencies of domestic instruction. The first attempt at establishing a regular system of medical instruction in this country, was not made until a very few years before the revolution; and for this we are indebted to Drs. *William Shippen* and *John Morgan*, both natives of Pennsylvania, who projected the plan during the prosecution of their studies abroad. In 1762, Dr. Shippen returned to his native country, and in that year delivered a course of lectures of anatomy to a class of students amounting to twelve in number. The lectures were repeated in 1763 and '64. In the following year Dr. Morgan, who had just returned from Europe, pronounced "A Discourse upon the Institution of Medical Schools in America," before the trustees of the college, in which he proposed a plan for teaching the different branches of medicine, and portrayed with prophetic ardor the blessings which would flow from such a measure. "Perhaps," said he, "this medical institution, the first of the kind in America, though small in its beginning, may receive a constant increase of strength and annually exert new vigor. It may collect a number of young persons, of more than ordinary abilities, and so improve their knowledge as to spread its reputation to distant parts. By sending them abroad duly qualified, or by exciting an emulation amongst men of parts and literature, it may give birth to other useful institutions of a similar nature, or occasional rise, by its example, to numerous societies of different kinds, calculated to spread the light of knowledge through the whole American continent, wherever inhabited." p. 58.

Happily he spoke to a body of men capable of entering into his expanded views; and measures were soon after adopted for forming a medical faculty. Dr. *Morgan* was appointed professor of the theory and practice of medicine, and Dr. *Shippen*, professor of anatomy and surgery. The other stations were not immediately filled. In 1768, Dr. *Adam Kuhn*,* a pupil of Linnæus, who had just returned

* Dr. Adam Kuhn was a native of Germantown, near Philadelphia, and born 1741. After receiving an elementary education in this country, he proceeded to Europe and for two years studied medicine at the University of Upsal, of which the celebrated Linnæus was one of the professors. He appears to have been a favorite pupil of that great man. After spending another year in London, he proceeded to Edinburgh, where he took his degree of Doctor of Medicine, in 1767, on which occasion he published a *Thesis de Lavatione Frigida*, dedicated to Linnæus. Dr. Kuhn was no author, but eminent as a practical physician and a useful teacher. He died at the age of 76, in the year 1817. *Eclectic Repository*, vol. 8.

John V. B. Tennent, M. D.,* professor of midwifery, and *Samuel Bard*, M. D., professor of the practice of physic.

These gentlemen were fully competent to the enterprize they had undertaken. Their learning and abilities were unquestionable, and the manner in which they discharged their several duties seems to have been highly satisfactory. At the opening of the College, public introductory lectures were delivered, which drew forth warm marks of approbation from the trustees of the college. The following appears on the minutes. At a meeting of the Governors, on the 25th of Nov. 1767: it was "Ordered, that Mr. Attorney General, the Rev. Mr. Auchmuty, and the Rev. Mr. Cooper, be a committee to communicate to the several medical professors, the high opinion this corporation entertains of the learning and abilities whereby they have respectively distinguished themselves, particularly in their introductory lectures; to thank them for the zeal they have expressed for the honor of this seminary, and the pains they have taken to promote its interest, and to signify their hopes that the said professors, by a continuance of their services, will render the science of medicine much more respectable than it hath hitherto been in this country, to their own honor, the reputation of the college, and the great emolument of the public."†

A measure so honorable to those immediately concerned in effecting it, and to the city itself, promised not merely to elevate the character of our profession, but to be productive of general good to the community. The fair prospects thus anticipated, were all arrested by the war.

The schools thus started in Philadelphia and New-York, were the only ones attempted before the revolution. The first medical degrees were given by the college of New-York. In 1769, the degree of *Bachelor* in medicine was conferred upon Samuel Kissam and Robert Tucker. In 1770, the degree of *Doctor* in medicine was conferred upon the last of these gentlemen, and in May of the following year, upon the former. In June, 1771, the degree of *Doctor* in medicine

* Dr. Tennent was a native of New Jersey, and had received the benefits of European medical education. He appears to have been an able lecturer. He died at an early age, in the West Indies, where he had gone for the benefit of his health.

† An Historical Sketch of Columbia College, in the City of New-York. By N. F. Moore. N. York: 1846. p. 63.

was conferred on four students, by the Philadelphia college, being the first given by that institution.

The establishment of Medical Faculties was unquestionably the most important event which had yet taken place in the history of our colonial medicine. It at once presented our profession in a new and imposing attitude before the public, and is associated with many circumstances of high interest. Not the least of these is, that it was the result entirely of *individual enterprise*, and originated in the bosom of the profession itself. The men who conceived it too, were prepared to carry it through. The college in New-York, especially, Minerva like, came into existence ready armed and equipped for the purposes of education in all the different branches of medical science. Although thus originating with individuals, the project was not premature or visionary—both the profession and the public were prepared for it, and it was no sooner started than it seems to have met with general favor.

There is another circumstance connected with the establishment of our first medical institutions which is deserving of especial notice, and that is the high value which at that early day was attached to *preliminary education*. On this subject Drs. Morgan and Middleton have left on record sentiments so creditable to themselves as 'men of cultivated minds, that I cannot refrain from quoting them.

“It will not be improper, however, to observe here that young men ought to come well prepared for the study of medicine, by having their minds enriched with all the aids they can receive from the languages, and the liberal arts. Latin and Greek are very necessary to be known by a physician. The latter contains the rich original treasures of ancient medical science and of the first parents of the healing art. The former contains all the wealth of more modern literature. It is the vehicle of knowledge in which the learned men of every nation in Europe choose to convey their sentiments, and communicate their discoveries to the world. As it is the best known of the dead languages, it is chosen as the most proper one, by the various nations of Europe, for a medium of intercourse among the learned, that is equally attainable by every one of them. Hence it becomes indispensably necessary for a physician, who is to derive his knowledge from so many different sources, to be well acquainted with Latin.

The French language has prevailed much in Europe. The advantages which we may reap from the writings of many eminent men, and of many learned societies which are published in French, make the knowledge of this language very valuable also to a physician. An acquaintance with mathematics and natural philosophy we cannot dispense with, since we can go but small lengths in natural or medical inquiries without their assistance. Happy are we to have all these taught in such perfection in this place. Destitute of that general knowledge which unveils to us the operations of nature, we cannot penetrate into those truths, that form the rules by which we ought to conduct ourselves in the cure of diseases.

There is no art yet known that may not contribute somewhat to the improvement of medicine ; nor is there any one which requires more assistance than that of physic from every other science. Let young men, therefore, who would engage in the pursuit of Medicine, of Surgery, make use of all their industry to possess themselves in good time of these acquisitions. They are necessary to facilitate a progress in the healing arts ; they embellish the understanding, and give many peculiar advantages, unattainable without them." Discourse p. 18, 19.

In the same spirit speaks Dr. Middleton: "No pupil ought to apply himself to the study of physic, till he has previously laid the foundation in a competent knowledge of classical learning, and some general acquaintance with the Mathematics and Natural Philosophy. No expense ought to be put in balance with the acquisition of every necessary branch of instruction, to insure a successful practice. He, who considers how he may go the cheapest way to work, too often purchases the name for the reality, the shadow for the substance. A candid and cursory view of the established practitioners here, and in the country around, will soon convince the most incredulous of the truth of this observation." p. 65.

It is mortifying to reflect that after the lapse of upwards of eighty years, the subject of preliminary education is precisely where it was. By enlightened individuals, the most glowing exhortations have been made from time to time in relation to its necessity and importance. As yet, however, no measure has been adopted by any of our colleges or public authorities to enforce this most radical of all reforms. Un-

til this shall be done, it is needless to expect that our profession shall attain the elevation and dignity to which she is justly entitled.

With regard to the works that were commonly read and studied, the following is stated by Bartlett. "Though the works of Hippocrates, Galen, Stahl and others, were not unknown, those of Sydenham, and his followers, were principally studied by our oldest practitioners, till the time of Boerhaave, whose invaluable labors commenced in 1701, which, with the commentaries of Van Swieten; the practical writings of Whytt, Mead, Brooks and Huxham; the physiology of Haller; the anatomy of Cowper, Kiel, Douglass, Cheselden, Munro, and Winslow; the surgery of Heister, Sharp, Le Dran and Pott; the midwifery of Smellie and Hunter; and the *Materia Medica* of Lewis, were in general use at our political separation from the British Empire.*

I have now completed the task which I proposed in the commencement of this discourse, which was to give a sketch of the state of medicine during our colonial existence. The revolutionary war succeeded. During that eventful period, our profession stood firm in their country's cause; and the names of Warren,† Mercer‡ and Rush,§ show that they were not idle spectators of the fray. Nothing was done, however, for the advancement of medical science. The newly formed medical colleges were broken up, and all the energies of the country directed to the attainment of a nation's highest hope and ambition. The revolution accomplished, and an independent government established, a new career was commenced. In common with every thing

* A Dissertation on the progress of Medical Science in the Commonwealth of Massachusetts. By Josiah Bartlett. Communications of the Medical Society of Massachusetts, vol. 3, p. 240.

† Major General Joseph Warren was born at Roxbury near Boston, in 1741. He studied medicine and practised his profession at Boston. At the first breaking out of the revolution, he turned his attention to arms, and was slain at the battle of Bunker hill, June 17, 1775. See Thacher's Medical Biography.

‡ "Hugh Mercer, M. D. a general in the revolutionary war, was a distinguished physician, who, like Warren, fell in the defence of the liberties of his country. He was a native of Scotland, and educated at Edinburgh. He early emigrated to Virginia, and settled at Fredericksburgh, where he practised medicine for several years with great reputation. During the revolution, he zealously engaged in defence of the liberties of his adopted country, and fell in the battle of Princeton; 1777." Prof. Sewall's Lectures, 1825, p. 60.

§ Dr. Rush was a member of the Congress of 1776, and one of the signers of the declaration of independence.

else, medicine felt the sacred impulse, and during the brief period of our independence, how has the scene changed ? Instead of the feeble beginnings of one or two institutions, twenty-eight well established medical colleges are now to be found in different parts of our country ; every city has its hospitals ; a thriving professional literature has sprung up among us, and we can now boast of authors whom we are not ashamed to mention along with those of European birth. What nation ever accomplished so much in an equal space of time, and under equal circumstances ?