

The FitzPatrick Lectures

ON

MEDICINE IN ENGLAND DURING THE REIGN OF GEORGE III.

DELIVERED BEFORE THE ROYAL COLLEGE OF PHYSICIANS
OF LONDON.

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I. GENERAL CONDITIONS—MEDICAL EDUCATION.

THE sixty years of the reign of George III witnessed vast intellectual changes which closed for ever the long period of feudalism. They saw the practical application of methods of thought which had been taking definite shape for the previous hundred years. They heard the death knell of principles which had enthralled and fettered Europe for centuries, and they saw the foundations laid of those conceptions of civil and intellectual liberty which have since governed the world. It was an age in which the principle was firmly established that free inquiry was the only sure road to the advancement of knowledge, toleration of opinion, and liberty of action.

But although this spirit of free inquiry was abroad in the land, and although its cause was championed by some of the mightiest intellects of that or any other age, yet for a considerable time its victory hung in the balance. Its full fruition was postponed for a number of years, for, in the course of its advance, the spirit of free inquiry met with a most powerful and determined opposition in a reactionary spirit which stood sullenly at bay, and during the last thirty years of the eighteenth century nearly succeeded in wrecking the whole movement.

This age is, perhaps, better known to us than any other in the annals of our history, and its close proximity to our own will surely enlist a measure of our interest and sympathy. The opulence of its literature has made us familiar with its customs, its manners, its great men, and its great women. The lives led by the people of that time, their formal old-world courtesy, their robustness of character, even their foibles, all appeal to us, and occupy a share of our affections. Then, again, the age of George III is adorned by some of the greatest names this country has ever produced. It is hallowed by the memory of Burke the first of political philosophers, of Fox the foremost champion of civil and religious liberty, of the stately Gibbon, of the endearingly simple Goldsmith, of the quartette of great Scotsmen, Hunter, Hume, Adam Smith, and Robertson, and of the commanding and representative personality of Johnson, better known, and dearer to us, perhaps, than any other.

If the foregoing be admitted as a true interpretation of the spirit of the age of George III; if it be granted that this age witnessed great general changes in thought and action, great advances in human progress, and the germs of that social and intellectual state under which we at present live, then it will surely follow that the same processes were in operation in the particular realm of medicine, and produced most important changes therein. It becomes, therefore, a matter of interest and profit to trace these changes; for I venture to think we shall find evidences, in such a study, of the inception of many customs, methods, and theories which have become accepted facts at the present time.

In order to accomplish this purpose it is proposed to attempt a description of the state of medicine during this period.

The proper appreciation of the particular quality of medical thought during the reign of George III involves a consideration of all thought and literature at that time. The last half of the eighteenth century was an age of transition, in which the human intelligence refused to be satisfied with mere speculations, in which it objected to accept ideas as true on the *ipse dixit* of so-called authority, and in which it evinced an overmastering craving for proof. In the second half of this century doctrines which had withstood the assaults of ages were seen to crumble and wither when subjected to the unrelenting process of investigation founded on a secure scientific basis. The same scientific method carried the thoughts of men to heights hitherto unscaled, and opened up vistas of knowledge never

before conceived. The honour of having wrought this change in thought belongs to the French school, of which the chief exponents were Voltaire, Montesquieu, and Rousseau. These men nurtured and brought to fruition the spirit of free inquiry and toleration, and although they borrowed the idea from Locke, Hobbes, and others in this country, they are nevertheless entitled to praise for having clothed it with their genius and imagination.

The first evidence of a change came in the domain of historical writing. Owing to the influence and incessant labours of Voltaire, history for the first time came to be written from a rational standpoint. In his *Le Siècle de Louis XIV* for the first time it was no longer a narration of the trivial acts and peculiarities of kings and captains, but an exhaustive inquiry into the manners, customs, and economic conditions governing the destinies of peoples. After this almost every branch of literature and thought was involved in the same change, until in the closing years of the eighteenth century was witnessed the final emancipation of the human intellect, the last struggles of feudalistic principles, and the dawn of civil, intellectual, and religious freedom. This beneficent stream of unfettered thought was at first without channels, and, with the flood-gates wide open, it bid fair to swamp the very things it was intended to conserve and foster. But as time went on it became more and more directed, until early in the nineteenth century it was so controlled that its full benefits became manifest in every department of life and thought. In a word, the spirit of scientific inquiry became universal, and the days of mere speculation were numbered.

When we come to consider the evolution of medical thought during this epoch, little difficulty is experienced in instituting a parallel with the change that had taken place in intellectual Europe. Until the end of the eighteenth century the spirit of scientific inquiry and the desire to appeal to facts ascertained by experiment did not influence medical thought to any great extent. Harvey, the glory of this College, was so in advance of his time that he was doomed to wait a century for that suitable soil on which his seed could come to fruition. Indeed, we are forced to the conclusion that medical thought during the first half of the eighteenth century accomplished scarcely anything that has withstood the test of time. The theories of medical science then promulgated were often the results of metaphysical speculations, and little or no attempt was made to submit them to the supreme tests of scientific proof. For this reason the systems, raised up with so much labour, and at the expense of such great philosophical ability, were soon swept away when tested by the experimental method.

After giving due attention to these various systems, it must be confessed that one rises from the task with a feeling of sadness—sadness that such powerful intellects wasted their abilities on work calculated so little to contribute to the real advancement of medical knowledge. Indeed, to express shortly our view of the effects produced upon medicine by the systems, we might, with slight substitution of words, adopt a passage from Lord Morley's *Voltaire*, and say, "For all the systems we see only dismal tracts of medical darkness, we hear only the humming of the doctors, as they serve forth to men thirsting after knowledge, the dross of a medical superstition."

The comparative absence of medical advancement during the first half of the eighteenth century can scarcely cause astonishment if the particular education and environment of physicians at that time be taken into account. Those who championed the new scientific method of inquiry were never weary of pointing out that much of the inability of thinkers to advance, and many of the misconceptions that had arisen concerning the fundamental principles of life, were largely due to the influence of the particular teaching then in vogue. They pointed out that a system of teaching which directed mental activities to the fixed and the past, was not conducive to an intellectual training for the purpose of advancing on new, and therefore untrodden, paths of thought. If this be true, there can be no doubt that physicians, during the early years of the reign of George III, lacked, as a rule, that particular kind of training, for they were largely under the influence of this special form of teaching. In many of them erudition in classical attainments far outweighed their eminence in medicine, and was, indeed, their chief claim to distinction. Their special mental training encouraged them to place more reliance upon speculative theorizing concerning

disease than upon the meaning of facts and conditions observed at the bedside and on the *post-mortem* table.

But a change for the better was close at hand. Early in the reign of George III the work of Morgagni began to produce an effect upon medical thought in England, and soon many physicians were engaged in obtaining a real knowledge of disease from the study of morbid conditions found after death. The logical consequence of the work of Morgagni found expression in the labours of Baillie and Bichat, both of whom carried the subject forward. These prominent men were the real fathers of modern pathology and medicine. They occupied positions similar to those of Voltaire and Montesquieu in thought, Burke in politics, and Newton in natural philosophy. They were bold innovators, who swept away an ancient order of things which had long cumbered the ground and defied advance. They established, on lines never since departed from, the only rational study of disease. Our debt to them can scarcely be expressed in words.

II. THE CONDITION OF THE MEDICAL PROFESSION IN THE EIGHTEENTH CENTURY.

Having thus summarized the general state of medical thought as it existed at the beginning of the reign of George III, it now becomes necessary to study the more intimate conditions found in the medical profession at that time.

During this reign the medical profession was divided into three grades—physicians, surgeons, and apothecaries. In London, and for seven miles around, these three divisions were governed respectively by the College of Physicians, the Corporation of Surgeons, and the Society of Apothecaries. But beyond this area none of these bodies exercised any very effective control over its members and its privileges. It therefore came to pass that many practitioners resided in the provinces who owned no allegiance to those bodies, and often possessed no legal title to practise either medicine or surgery.

The Ratio of Practitioners to Population.

It is difficult to arrive at any correct estimate of the numbers of practitioners in England at this time, for although the registers of the three licensing bodies can be consulted, they contain a small proportion only of the total. There is, however, one important source of information from which a fairly accurate estimate of the numbers engaged in practice can be obtained. In 1779 Dr. Samuel Foart Simmons, physician to St. Luke's Hospital, published the *Medical Register*. This was the first attempt to gather into one volume particulars of the medical profession and its activities. Unfortunately, only three issues were made, but in the last, which appeared in 1783, data are found from which an estimate of the numerical strength of practitioners resident in England may be made. From an investigation of this invaluable book, only three copies of which are known to exist in London, it is ascertained that in 1782 4,459 medical men were resident in England and Wales, to serve a population estimated at 7,814,827 souls, or one medical man for every 1,752 people. Of this number, 774 doctors were resident in London, with an estimated population of 650,845, or one medical man to every 840 inhabitants. The subject of overcrowding in the medical profession has been ventilated frequently of late years, but when the ratios just given are compared with those obtaining at the present day, no very marked difference will be found. At the present time about 25,000 practitioners in England and Wales serve a population of about 36,000,000, or one to every 1,440 people, while in London about 6,500 doctors attend about 4,500,000 people, or one to every 705 inhabitants. The author of *A Picture of the College of Physicians* estimated that in 1817, London, with a population of 1,100,000 had in residence 1,098 doctors, or one to every 1,000 people. Nor can it be said that the scale of remuneration for medical services rendered has altered to any considerable extent. Physicians in those days charged a guinea, at a time when the purchasing power of the sovereign was far greater than it is now. Indeed, it may be safely stated that a relatively larger number of physicians secured a handsome competence from the practice of their profession in the reign of George III than is the case at the present day, while some, such as Lettsom, Warren, Simmons, and Battie, realized large fortunes.

According to the *Medical Register* for 1783, London contained 149 physicians, 274 surgeons, and 351 apothecaries. This return takes no account of many who, owing to the laxness of supervision, sold drugs and practised surreptitiously without any proper authorization, and the same remark applies with greater force to the provinces. The College, jointly with the Master and Wardens of the Society of Apothecaries, had the power of supervision over drugs sold by apothecaries, but towards the latter part of the eighteenth century a new order had arisen, which, as we shall see, made it necessary to recast the laws and regulations governing the apothecaries. This new order was the druggists, and over these neither the College of Physicians nor the Society of Apothecaries had any jurisdiction.

An investigation of the composition of the College of Physicians, and of the parts of London favoured by those belonging to it during this reign, is of considerable interest. In 1746 the College was composed of 54 Fellows and 24 Licentiates. Of these, 47 resided in the City and 14 in the west end. In 1782 there were 43 Fellows and 74 Licentiates, of whom 35 lived in the City and 42 in the west. The migration from the City to the west had now begun to be marked, and in 1817 out of 89 Fellows and 224 Licentiates, 32 only lived in the City, while 105 practised in the west. From this time the exodus from the city progressed steadily, until at the present day two Fellows only remain to uphold the honour of the College in the heart of the greatest city in the world.

An examination of the number of Fellows and Licentiates admitted is also instructive. From 1760 to 1820 inclusive, 128 Fellows were created, or an average of 2.1 per annum, and during the same period 416 Licentiates were admitted, or an average of 6.9 per annum. During the last thirty years of George III's reign the influx of Licentiates became pronounced, and at the end of the reign they outnumbered the Fellows in a proportion of nearly three to one. The preceding account will, I trust, give a sufficient description of the numerical state of the profession, and will indicate the relatively small numbers of which it was composed.

Medical Laws and Regulations.

I now proceed to a consideration of the laws and regulations under which the medical profession worked at this period. No central authority possessing powers under parliamentary Acts existed, but the three corporate bodies of the College of Physicians, the Corporation of Surgeons, and the Society of Apothecaries respectively exercised jurisdiction over the physicians, the surgeons, and the apothecaries. But even then the power to assert authority by these bodies was limited and often exhibited in a lax manner. As might be supposed, their charters, granted in a bygone age, were ill adapted to new and constantly changing conditions. They referred rather to the profession resident in London, and contained no strict provisions for the governance of those of their members who resided in the provinces. The College of Physicians had ample authority over all physicians engaged in practice in London, and no physician could pursue his vocation in the metropolis and seven miles around without a licence from the College after having been duly examined. Also, by the first statute (14 and 15 Henry VIII, c. 5), which confirmed the charter, the College was given power to examine and grant a licence to all physicians in England, with the important exceptions of graduates in medicine of Oxford and Cambridge. Over them it had no jurisdiction so long as they practised in the provinces. Previous to the granting of the first charter of the College, the right had been conceded to the Bishop of London and the Dean of St. Paul's, with the assistance of physicians and surgeons, to examine and grant licences to those wishing to practise. The same right was also given to a bishop or his vicar-general in the provinces. Even so late as 1687 some bishops continued to exercise this right, and the practice was not discontinued until the College issued a warning on the subject to each bishop. In addition to its other powers, the College was possessed of the right of entering apothecaries' shops in order to inspect the drugs sold.

In much the same way the Corporation of Surgeons and the Society of Apothecaries exercised jurisdiction over members of their bodies, but the control was far less efficient than that of the College. In London it was fairly effective, but in the provinces it left much to be desired.

This failure of control, especially so far as regarded the Society of Apothecaries, was due to the fact that it had no authority over those who were not members of the society. Consequently a large body of practitioners came into existence; and soon caused considerable alarm. These men were not members of any legally constituted body; they held no diploma entitling them to practise medicine and surgery; but, nevertheless, they carried on their business without let or hindrance. Soon they formed the majority of the medical profession, but no power existed by which they could be brought under control. In London these buccaneers of the profession could be dealt with efficiently, but not so in the provinces. According to John Mason Good, these men were merely druggists who, in addition to selling drugs, compounded and dispensed medicines, and practised medicine and surgery. They sold pure drugs to the apothecary, but reserved the impure drugs for their own use. They were unversed in Latin, and could not, therefore, read prescriptions. They first made their appearance at about the end of the seventeenth century, and towards the end of the eighteenth century they had become so numerous that it was felt on all sides that something should be done to bring them under some sort of control.

The Apothecaries Act, 1815.

The result of this incursion of unqualified and ignorant men into the medical profession was the passing of the Apothecaries Act in 1815, but before that could be done public opinion had to be roused concerning the danger. In this agitation for a better state of things the names of John Mason Good and George Man Burrows stand out prominently, and it was owing almost entirely to their powerful advocacy that the reform was brought about. The former founded the "Pharmaceutic Association" in 1794, while the latter was responsible for the "Association of Surgeon-Apothecaries," both being devoted to the improvement of the position of that branch of the profession. If they received no encouragement, at least they met with no active opposition from the Colleges of Physicians and Surgeons, and soon the labours of the two associations bore fruit. On August 1st, 1815, the Apothecaries Act became law, and for the first time in the history of medicine in this country cognizance was taken of the principle that all those who practised must first be properly qualified.

By the provisions of the Apothecaries Act all those who kept an apothecary's shop were required to pass an examination before examiners appointed by the Society of Apothecaries, and all candidates for the examination had to give proof of having served five years as apprentices. The Master and Wardens were given power to enter any apothecary's shop in England and Wales and to impose fines if impure drugs were found. Finally, no apothecary could recover debts in a court of law unless he possessed a licence to practise.

There can be no doubt that the passing of this Act marked an immense advance in the regulations for the control of the profession, and it was the forerunner of all subsequent Acts. It had, however, its defects, and it would have been well had the two Colleges inquired more closely regarding the consequences of this Act. What was the effect of this Act? At a stroke the education of three-fourths of those who contemplated entering the medical profession was placed under the entire control of the Society of Apothecaries through legal powers granted by Parliament. The Colleges had no voice in the matter of determining the scope of medical education, and could deal only with those belonging to their own bodies. It must be admitted that their policy was somewhat short-sighted, for it would have been a comparatively easy matter to adjust their relations with the Society of Apothecaries in such a manner that a share of the control conferred by Parliament would have fallen to their lot. As it was, the Colleges were shut out from all participation in the control of the greater number of the profession, and many years had to elapse before they regained their power.

III. MEDICAL EDUCATION.

I now come to a consideration of the facilities existing for the acquirement of medical knowledge during this period, and to inquire concerning the standard deemed necessary. At this time the three capitals of the British

Isles were the only centres at which medical education could be obtained, and with regard to the number of students, London and Edinburgh were much ahead of Dublin. In London seven general hospitals were established where a knowledge of medicine could be obtained. At Guy's, St. Thomas's, and the London Hospitals systematic courses of lectures in the theory of medicine, materia medica, chemistry, and clinical medicine were given, but in most of the other hospitals the teaching was sadly neglected. Too often the members of the medical and surgical staffs considered it to be no part of their duty to give instruction except to a few favoured pupils from whom they took a premium for the privilege.

As a rule, the subjects of medicine, materia medica, anatomy, and chemistry were taught at schools and lectures supported by private enterprise, of which there were many in the metropolis at the time. In the *Medical Register* for 1783 a page is devoted to a list of lectures, and of the nineteen given there, all were supported by private enterprise, with the exceptions of those at the London, St. Thomas's, and Guy's Hospitals. Indeed, it appears that Dr. George Fordyce of St. Thomas's, Dr. William Saunders of Guy's, and Dr. Maddocks of the London were the only physicians who gave systematic courses of lectures at the institutions to which they were attached. In the same manner midwifery was taught by means of private lectures given by Denman, Osborne, John Clarke, and David Davis. Prominent among these private lecturers was Dr. George Fordyce, who lectured for thirty years on physic, materia medica, and chemistry at his house in Essex Street, Strand. He was assiduous and unremitting in his work; beginning at seven in the morning, he delivered three lectures, each lasting an hour, on six days in the week, and probably nearly all students coming to London at this period passed through his hands. The teaching of anatomy was carried on chiefly at the school in Windmill Street, where the brilliant abilities of the two Hunters, Hewson, Cruickshanks, Wilson, and Baillie made it deservedly famous. Mr. John Shelden and Dr. R. Maclaurin at their respective houses also taught anatomy with considerable success.

After a student had attended lectures and the practice of a hospital for a sufficient length of time, which varied at different periods, he was free to present himself for examination at the Corporation of Surgeons, or the Society of Apothecaries, and if he satisfied the examiners he was granted a diploma. Often however, he did not follow this course, but after studying medicine and surgery, betook himself to the provinces and began practice as an apothecary without any diploma. He was quite secure, and no law could reach him so long as he kept away from London.

When, however, a student decided to practise as a physician, the course to be pursued was different and far more exacting. It was necessary for him to obtain a degree in medicine in some university and in due time to submit himself to the examination for Licentiates at the College of Physicians. This course was obligatory for all physicians except those who chose to practise in the provinces, in which case the possession of the M.D. of either Oxford or Cambridge exempted them by statute from being obliged to become Licentiates. From all accounts the examination for the Licence of the College, which was conducted in Latin, was thorough and searching. It not only established the fact that a successful candidate was learned in medicine, but it proved also that he was a man of considerable erudition and culture. The examination for the candidate for the Fellowship was precisely the same as that for the Licentiate, and the College could justly claim that the members of their body were men of far higher mental attainments than those of the Corporation of Surgeons and the Society of Apothecaries.

At the universities of Oxford and Cambridge the professors of physic and anatomy gave courses of lectures, and so also did the professors or readers of anatomy, botany, and chemistry, but the reading of these lectures appears to have been of a somewhat perfunctory nature, and no practical instruction seems to have been given. Those who intended, therefore, to become physicians settled at centres in this country and on the Continent where the serious study of medicine could be prosecuted, and, except for the purpose of fulfilling the requirements of the universities in the matter of a medical degree, were hardly ever in residence.

The regulations relating to medical degrees differed at the sister universities, and are difficult to follow with any exactness. According to the author of *An Address to the College*, the method of procedure in granting medical degrees at Oxford was as follows: No person could be admitted to the honour of a doctor's degree in medicine until he had been a member of the university for fourteen years, and had complied with all the exercises required. In other words, he was expected to become a Bachelor of Arts in four years, a Master in seven years, a Bachelor of Medicine in ten years, and a Doctor in fourteen years. The principle, therefore, of a degree in Arts before proceeding to one in medicine was established. For the B.A. degree candidates were required to defend questions in logic, grammar, rhetoric, and moral philosophy; to be examined in the same, and all the examinations and exercises were conducted in Latin. For the M.A. degree the candidate was again required to defend questions in the subjects for the B.A., and, in addition, questions in natural philosophy. He was expected, also, to defend three other questions of any kind, and to read six lectures, in the Latin tongue, in natural and moral philosophy. Lastly, he had to pass an examination in geometry, metaphysics, optics, physics, history, geography, chronology, Latin, and Greek. The exercises for the same degrees at Cambridge appear to have been similar, but perhaps more latitude was allowed to candidates in specializing in particular subjects. Now, whatever may have been the way in which these exercises were kept in the letter—and many asserted that they were a mere farce—there can be no doubt that in the spirit they contained the framework of a comprehensive intellectual training. Indeed, those who relied on the system at the two universities as the best preliminary course for physicians, could point with truth to the regulations in force to prove their argument. For the M.B. degree the candidate was required to defend two subjects in physic for two hours, and to oppose two others for a like period. In 1760, according to Dr. Wells, the Act for the M.B. degree consisted of reading the *Aphorisms* of Hippocrates. However that may be, the candidate was obliged to go through a course of anatomy before proceeding to keep the Act. For the M.D. degree the candidate was required to explain a whole book of Galen in six extempore, or three written, lectures.

At Cambridge, perhaps, a more pronounced attempt was made to impart medical knowledge by means of lectures, and the professors appear to have performed their functions with some show of energy. The degree of Bachelor of Medicine could be taken six years after admission, provided that the candidate had kept nine terms at the university. Two public disputes had to be maintained in Latin by the candidate. One question was chosen by the candidate, and the other by the professor. The candidate then read a thesis on his own question, and defended it and the professor's question against the arguments of the professor and other doctors present. Finally, the professor read his "determination" in Latin. This proceeding was conducted in public, and, as a rule, many spectators were present. The degree of M.D. could be taken five years after the M.B., and the exercises required were on the same lines as those for the M.B. Dr. Wells states that originally the candidate was obliged to oppose another candidate, but that this regulation was abrogated on the payment of a fine of twenty shillings. He also asserted that the professor's question could be obtained by the candidate at any time, however long, before the Act was kept. At Cambridge and Oxford a doctor's degree in medicine was sometimes given by royal mandate, and apparently it was not always obligatory to proceed in Arts before taking the M.B. degree, although this course was generally pursued. The foregoing, then, is a picture of the course of education followed by many of those who desired to become physicians. The tendency of that education was in the direction of general culture, and accounts for the high order of mental attainments which was such a prominent feature of the College of those days. In other universities the same spirit prevailed, but the insistence on general knowledge was far less pronounced, and more attention was paid to the special subjects connected with medicine. An education acquired at a university in the days of George III gave a man a more marked distinction from his fellows than it does in our day.

IV. THE ESTABLISHMENT OF DISPENSARIES.

In close association with the facilities for acquiring medical knowledge was the rise and development of the dispensaries in London, one of the most remarkable features in the medical history of the reign. So far back as 1696 an attempt had been made by this College to establish a dispensary for the benefit of those who were too poor to purchase pure drugs, but after a time the project fell into abeyance. With that single exception, no dispensary existed in the metropolis until 1770, when the General Dispensary in Aldersgate Street was founded. This was followed in 1774 by the Westminster General Dispensary, and between that date and 1820 no less than twenty-four similar institutions came into being, of which fifteen remain in active work at the present day.

The need for increased facilities for the medical treatment of the poor of growing London, and the wider conceptions in vogue concerning the duties of the rich towards the poor, no doubt, were largely responsible for the foundation of the dispensaries. Many of these institutions, however, owed their origin to the insistent demands of energetic physicians who, supported by their influential friends, desired a field for clinical work. At that time physicians of great ability were beginning to flock to London; the possibilities of obtaining positions where they could found professional reputations as teachers were limited, and the staffs of the hospitals were small. In this difficulty the more enterprising spirits threw themselves with ardour into the project, and so it came about that the dispensaries were staffed by some of the ablest and most enlightened physicians in the town. The names of Lettsom, James Sims, Hulme, Simmons, Willan, Wells, and Cooke are prominently associated with this movement, and some of the dispensaries, such as the "General," the "Westminster," and the "Public" soon became centres for teaching, and the excellence of the clinical instruction attracted many students. A particular interest attaches to the Public Dispensary in Carey Street, for it was there that Robert Willan and his pupil Thomas Bateman prosecuted their researches in dermatology and gave to the world the first attempt to classify skin diseases from an anatomical standpoint.

Many special hospitals and institutions also began their activities in this reign, or a few years before its commencement. Thus, between the years 1749 and 1820, seven lying-in hospitals and dispensaries, three institutions for venereal disease, three vaccine establishments, one fever hospital, and one lunatic asylum were founded in London; surely a worthy testimonial to the medical progress of the age and the energy of the physicians.

V. MEDICAL SOCIETIES.

Further evidence of the medical activity of this reign is found in the rise of the numerous societies devoted to the advancement of medicine. Probably the earliest society of this kind of which we have any record was one founded by Glisson about 1650, and mentioned in his work on rickets. The next was the Society of Naval Surgeons, which began its career in 1746. This society engaged Mr. Sharp to deliver lectures on surgical operations, and met at a house in Covent Garden. Sharp was soon succeeded by William Hunter, who continued the course for several years. In 1752 a medical society was formed, chiefly owing to the energy of William Hunter, and met at the Mitre Tavern. The next to be founded was the "Medical Society of Physicians," in 1764, by John Fothergill, and one of its presidents was William Hunter. Licentiates of the College only were eligible for election, and the meetings were held at Old Slaughter's Coffee House, but once a quarter the members dined at the Crown and Anchor. In 1767, at the instigation of Dr. Heberden, the "Meetings of the College of Physicians" were begun, and between that date and 1820 six volumes of transactions were issued. The year 1771 saw the establishment of the "Guy's Physical Society" by Dr. William Saunders, and the same year witnessed the foundation of the "Physico-Medical Society." In 1773 the "Medical Society" was founded, and in the following year the "Middlesex Hospital Society" began its career. Mr. Shelden formed a medical society in 1779, which met at his house in Great Queen Street, and in 1782, owing to the efforts of Dr. Simmons, Dr. Fordyce, and John Hunter, the "Society for the Improvement of Medical Knowledge"

was formed, the meetings being held at Old Slaughter's Coffee House. Fordyce was also responsible for the foundation of the "Lyceum Medicis Londinense" in 1785. Finally, the "Abernethian Society" was established in 1795, the "Medico-Chirurgical" in 1805, and the "Hunterian" in 1819. A society of Physicians to Dispensaries met in the Borough about 1780, but the exact date of its foundation is uncertain.

It will thus be seen that twelve medical societies were formed during the reign of George III, and three only before that period. Many of them came to an end after a few years of usefulness, but six remain, and are flourishing at the present time. Among those who did so much to encourage the formation of these societies, the names of Simmons, Fordyce, William Hunter, Fothergill, and Lettson must for ever be honoured. They toiled, not unsuccessfully, for the advancement of medicine and for a wider medical polity where men holding diverse opinions could meet and exchange their views.

(To be continued.)

THE RELATIVE GERMICIDAL EFFICIENCY OF ANTISEPTICS OF THE CHLORINE GROUP AND ACRIFLAVINE AND OTHER DYES,

WITH OBSERVATIONS OF THE RATIONAL TESTING OF ANTISEPTICS.

BY

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(Report to the Medical Research Committee.)

THE object of the following paper is to point out certain common errors in the testing of antiseptics of the chlorine group which lead to totally inaccurate inferences as to their germicidal potency; secondly, to compare the results obtained by methods eliminating these errors with those furnished by other antiseptics; thirdly, to examine the claims made by Browning and his colleagues¹ for the alleged vastly superior germicidal potency of acriflavine and certain other dyes; and, lastly, to indicate how important the matter of the velocity of disinfection is in forming a judgement of the utility of antiseptics in surgical practice, and also the methods suitable for their successful employment.

The Testing of Antiseptics of the Chlorine Group for Germicidal Action.

The instability and reactivity of the hypochlorites and other antiseptics of the chlorine group has long been known. Their ability to react with proteins, peptones, and amino acids to furnish products some of which still possess germicidal properties (chloramines), and others which are entirely inert (chlorides and compounds containing chlorine united to carbon), has been definitely determined. When a relatively large excess of protein acts on minimal quantities of hypochlorite, no chloramine derivatives persist, and the whole of the chlorine is converted into germicidally inactive forms. Notwithstanding these well established facts current literature contains countless examples of experiments in which workers have taken protein-rich media, then added minute quantities of the chlorine antiseptic; subsequently, after an unstated interval, when all or most of the antiseptic has been decomposed, the mixture is inoculated with organisms, and surprise is expressed at their ability to grow unchecked. Under such circumstances the observed results depend much more on the rate of reaction between the antiseptic and the protein medium than upon germicidal action.

In making tests of the germicidal efficiency of any antiseptic there seems to be no good reason for not following the order of mixing the materials indicated by the conditions of their practical use—namely, to add the antiseptic last to the inoculated medium. Under these conditions very different results are obtained with unstable antiseptics, compared with those observed when the organisms are added last. Perhaps the most naive alleged demonstration of the inutility of hypochlorites as antiseptics was that offered by Delbet, who took egg albumen, added a little hypochlorite of undetermined strength, next heated

the mixture for a considerable time, so that all the antiseptic would be decomposed with certainty, and then found, to his evident satisfaction, that streptococci could grow in the residue. Equally enlightening experiments have led various workers into statements as to the excellence of hypochlorite solutions as culture media for *B. capsulatus* and *B. pyocyaneus*, but these entertaining speculations need not be seriously considered.

More recently, however, Browning and his colleagues have published a series of experiments in which the germicidal potency of various antiseptics of the chlorine group is compared with various dyestuffs, with results which apparently indicate an enormous superiority for the latter. Numerical ratios for the relative antiseptic potency of the various substances are given, in which the lethal concentration of chloramine-T tested against staphylococci in serum is taken as unity. The lethal concentration of chloramine-T in serum is stated to be 1:250 without reference to much lower concentrations already published by others. The discrepancy is due, in the main, to the fact that the antiseptic was added first to the medium and the organisms last. No indication is given by Browning of the all-important interval of time elapsing between the two additions. From what has been already stated, it is clear that by this method of procedure irregular results are inevitable.

In the following table, a few new experiments are given, showing the results of the action of chloramine-T when tested against *Staphylococcus aureus* in blood serum and in 0.7 per cent. Witte's peptone, the antiseptic being added last as in actual practice.

In these experiments the medium (2 c.cm.) was inoculated with a suspension in saline of an agar slant growth of *Staphylococcus aureus*. The chloramine-T solution (1 c.cm.) in varying concentration was added last, and at regular time intervals the number of surviving bacteria was estimated by plating. In every case any unchanged antiseptic was destroyed before plating by the addition of sterile sodium thiosulphate solution.

TABLE I.—Chloramine-T.

Medium used: Horse serum. Concentration of chloramine-T in mixture, 1:1000.		Bacterial Count.*	
Time of Action.			
0	1,750
5 minutes	0
Medium: Horse serum. Concentration of chloramine-T in mixture, 1:2,000.			
0	1,831
5 minutes	9
15 "	15
45 "	49
90 "	85
3 hours	307
Medium: Horse serum. Concentration of chloramine-T in mixture, 1:3,000.			
0	1,509
5 minutes	82
15 "	95
45 "	211
90 "	627
3 hours	1,308
Medium: Witte's peptone, 0.7 per cent. in saline. Concentration of chloramine-T in mixture, 1:4,000.			
0	82,090
5 minutes	0
Medium: Witte's peptone, 0.7 per cent. in saline. Concentration of chloramine-T in mixture, 1:5,000.			
0	82,400
5 minutes	14,520
15 "	0
Medium: Witte's peptone, 0.7 per cent. in saline. Concentration of chloramine-T in mixture, 1:6,000.			
0	1,323
5 minutes	13
15 "	12
45 "	14
90 "	16
3 hours	37

* 1 drop = $\frac{1}{20}$ c.cm.

From these results it is clear that under the above conditions the lethal concentration of chloramine-T in blood serum is slightly under 1:2,000, and in 0.7 per cent. Witte's peptone between 1:5,000 and 1:6,000. These figures contrast with 1:250 and 1:2,000 respectively given by Browning and his colleagues. The use by Browning of the figure 1:250 for the lethal concentration of chloramine-T against *Staphylococcus aureus* as a standard for calculating the relative antiseptic potency of other substances is clearly misleading.

The fundamental error in Browning's figures for the antiseptic potency of chloramine-T is again encountered in