MEDICINE IN TUDOR AND STUART ENGLAND:

A STUDY IN SOCIAL HISTORY

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THESIS

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CHAPTER I

MEDICAL EDUCATION

The influence of the Renaissance upon medicine in England began with the Oxford Humanists. Such men as Colet, Grocyn, Linacre, and Thomas More made Oxford famous as a seat of learning. In 1516 Bishop Fox founded Corpus Christi College at Oxford in the interests of the new learning, and John Fisher promoted the spread of Hellenic thought at Cambridge. Once this new learning was established in the universities, it influenced national thought and practice.¹

Thomas Linacre is regarded by many as the most outstanding of the Humanist physicians. After attending Oxford, he went to Italy to continue his studies, returned to England to lecture on medicine at both Oxford and Cambridge, and finally became the tutor of Prince Arthur. He continued to serve as court physician under Henry VIII,² and one of his patients was Cardinal Wolsey. Wolsey's activities were by no means restricted to the direction of governmental matters; he also endeavored to influence English culture. He


founded Cardinal College at Oxford and created six professorships. One of these was for medicine, which may indicate the influence of Linacre.3

Linacre's knowledge of Greek seems to have been an important factor in his rise to fame. He is said to have been the first Englishman to read Aristotle and Galen in the original Greek. The actual medical knowledge contained in these tracts could not have benefited his patients to a great extent, and it has even been said that "the reason Linacre did not do more harm as a physician was that the times were too much for him."4 But Linacre's knowledge of Greek enabled him to prepare and introduce accurate texts of the medical classics into England, thereby spuriously enhancing his importance to medicine. He made no original contribution to the field of medicine; but his name is immortal because he found the practice of medicine in England in the hands of illiterate monks and empirics, and through his influence made it a more honored profession.5

John Key, or Caius, repeated in a general way the pattern of Linacre's life. He studied abroad, was Professor of

3H. Kury and H. Haig, "Medical Oxford and Cambridge During the 16th and 17th Centuries," Ciba Symposia, III (June, 1941), 877.


5Luginbuhl, op. cit., p. 67.
Greek at Padua, and upon his return to England was appointed physician to Edward VI. Interested in theology, classical philology, and natural history, he was described by Conrad Gesner as "the most learned physician of his age." Besides being the author of several original works, Caius was co-founder of Gonville and Caius College, and was primarily responsible for introducing the study of anatomy into England.

The scholar-physicians, of whom Linacre and Caius are outstanding examples, occupy, in spite of their limitations, a respected position in the history of medical and scientific advance. They effectively bridged the period between the Middle Ages and the beginning of modern scientific methods. True, their knowledge was not obtained through experimentation, but the scholarship in which they excelled was of the greatest importance to the medicine of their era. By the accurate work of these scholars, the pure texts of the medical classics were restored, and in this way students of medicine were enabled to begin anew their investigations. Also, the scholar-physicians were deeply imbued with the ideals of Humanism—ideals which led directly to the establishment in England of institutions for the promotion of medical and scientific disciplines.

6 Langdon-Brown, op. cit., p. 67.

The interest of these scholars in raising the standards of the medical profession was reflected in the concern of the government about existing conditions. In 1511 an Act was passed which regulated the practice of medicine in London. The preamble to this Act mentions the deplorable state of medical practice as follows:

The science and cunning of physick and surgery is daily within this realm exercised by a great multitude of ignorant persons, of whom the great part have no manner of insight in the same; some also can read no letters on the book, so ... that common artificers, smiths, weavers, and women, boldly and accustomably take upon them great cures and things of great difficulty, in which they partly use sorcery and witchcraft, partly apply such medicines as to be very noxious and nothing meet therefore, to the high displeasure of God, great infamy to the faculty, and the grievous hurt, damage, and destruction of many of the king's liege people.

This Act made it unlawful for anyone to practice medicine or surgery in, and for seven miles around London without being first examined and approved by four doctors of medicine or surgeons acting under either the Bishop of London or the Dean of St. Paul's Church. Theoretically, similar regulations were in effect outside the seven-mile area.

In 1518 there was established the Royal College of Physicians, the "Congregated College" as Shakespeare terms it.

8 M. T. Bly, "Early English Medical and Surgical Legislation," Medical Record, XXIV (September 1, 1885), 236.

Linacre's thoroughgoing influence on English medicine is once again evident from the letters patent which stated that in establishing this organization the King was motivated by the example of similar institutions in Italy and elsewhere, and by the advice of Linacre and Cardinal Wolsey.\textsuperscript{10} The letters patent specifically provided that only graduates of Oxford and Cambridge might practice "physic" in England. Others might do so after examination and approval by the President and three of the Elects of the Royal College, or upon receipt of a dispensation, but not otherwise. The document also indicated that only those practitioners who were "profound, groundedly learned and deeply studied in physic" were to be allowed to practice medicine.\textsuperscript{11}

Soon after its formation, the Royal College of Physicians began to exercise a powerful legal function. In 1540 an "Act for Physicians and Their Privileges" was passed, by which physicians were exempted from keeping "watch and ward."\textsuperscript{12} More important, however, was the authorization given to the College, in an early day version of the Pure Food and Drug Act, to appoint four of its members to examine the contents

\textsuperscript{10}A. S. MacNalty, "The Renaissance and Its Influence on English Medicine, Surgery, and Public Health," \textit{British Medical Journal}, II (December 1, 1945), 757.

\textsuperscript{11}Ibid.

\textsuperscript{12}Ibid., \textit{op. cit.}, p. 236.
of the apothecary shops and to enforce the following regulation:

... all such drugs and stuffs as the said four persons shall there find defective, corrupted, and not meet nor convenient to be ministered in any medicine for the health of man's body ... the same four shall cause to be burnt or otherwise destroy the same.13

In a further attempt to raise the standard of medical practice throughout the country, the academic requirements at Oxford were made more exacting. The University regulations stipulated that the prospective physician should study fourteen years for the degree of Doctor of Medicine. He first had to obtain the Master of Arts degree as evidence of sufficient knowledge of Greek and Latin and an adequate preparation in dialectics and physics. Then he could begin the medical course which lasted seven years. As a part of his training, he was required to dispute twice, respond once, and see two anatomies before securing the bachelor's degree. Before being admitted to practice, he was required to perform two anatomies and to effect at least three cures.15 Although it is apparent that the old scholastic form of the disputation still survived, the beginning of a new era is evident in the requirement of practical exercises and anatomical studies.

13 Ibid.


All this contributed to the improvement of medical practice, but only to a very slight degree. Oxford granted only forty-seven medical degrees from 1571 to 1600, and during the first forty-two years of the sixteenth century, the degrees of Bachelor of Medicine and Doctor of Medicine were conferred only once each at Cambridge. This number, even with an increment of graduates of foreign medical schools, was inadequate to serve the medical needs of the English people. Indeed, graduates in medicine were so scarce that on ceremonial occasions it was often a problem to find a Doctor of Medicine. The situation at Oxford, furthermore, was not calculated to produce graduates of high quality. When Giordano Bruno visited the University in 1581, he found "the graduates ignorant and pedantic, the students much too interested in beer drinking, and the Oxonians in general arrogant enough to make even a Job lose his patience."  

The chief weakness in medical education at this time was the hostility to new ideas. Medical education was based on the doctrines of Galen, which were accepted without question. As late as 1559, a certain John Geynes was reprimanded by the College for questioning the Galenic teachings, and was excluded from Fellowship in the group until he recanted.

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16 Ibid. 17 Kury and Haig, op. cit., p. 879.
18 Ibid., pp. 879-880.
19 Sir Walter Langdon-Brown, "The Background to Harvey," British Medical Journal, II (October 24, 1936), 793.
Strangely enough, it was the reign of Mary Tudor which contributed in large measure to the awakening of a progressive scientific spirit in England: many scholars fled to various centers of European culture during her reign and returned to England at the accession of Elizabeth, bringing back new ideas which contributed to a wider culture than England had known previously.20

English medical education was also affected by the abolition of the religious orders by Henry VIII, since the removal of the clergy from Oxford and Cambridge brought about a partial social re-stratification. Members of the middle class could no longer acquire a higher education by monastic affiliation, so that the two Universities gradually tended to become educational institutions for the wealthy. As a result, the emphasis of the medical curriculum in the Universities was focused on the place of medicine as a branch of scientific education rather than on its more practical technical aspects.21

Medical education during the seventeenth century followed the same pattern of slow evolution which it had pursued in the sixteenth century. In retrospect, one views the startling achievements of the seventeenth century with something like awe. But there was certainly no sharp change in the methods of medical education, which continued to be

20 ibid. 21 Kury and Haig, op. cit., p. 878.
centered primarily at Oxford and Cambridge. As in the past, it was still possible to secure a medical degree through royal or ecclesiastical patronage; but in the main physicians in good standing continued to seek university degrees.

During the seventeenth century there was also evidence of infiltration of a more progressive scientific viewpoint into the deeply entrenched classical curriculum. This change, however, came about slowly. As early as the reign of Edward VI, a Royal Commission had been sent to Oxford for the purpose of revising the educational system; but by the beginning of the seventeenth century the total apparent result was one Regius Professorship of Medicine at each University, one or two Linacre Lecturers, and a few fellowships designated for medical students.

The need for reform was officially recognized during the reign of Charles I. William Laud, Archbishop of Canterbury, was appointed by Charles to examine the condition of university education, especially at Oxford, and to recommend desirable changes. The findings of Laud's Commission were expressed in a new set of statutes, called the Caroline Code.

22 These latter were known as Lambeth M. D.'s, named after Lambeth Palace, the residence of the Archbishop of Canterbury. The right to grant such M. D.'s was not abolished until the Medical Act of 1858.

The purpose of the Code was to make university education more efficient by regulating the life of the students and the duties of the professors according to High Church precepts. Certain benefits may well have followed from the application of the Caroline Code for a few years after its adoption; but by the end of the seventeenth century the Code was definitely outmoded, and drastic changes were once more needed.

According to the Caroline Code medical studies were to be regulated with the same strictness as other branches of education, but this meant, in effect, the continuation of the old system. After obtaining the Master of Arts degree, the student was required to attend the lectures of the Regius Professor for three years and to engage in two public disputations. The Professor, in turn, was instructed to lecture "in Hippocrates and Galen." The doctorate in medicine was conferred on the student only after four additional years of attendance at the lectures of the Regius Professor; in addition, either a public reading of six lectures or an explanation of any of the books of Galen was required. The student had further to swear that he had attended the four lectures which made up the commentary on a complete dissection, and that he had heard one entire lecture on the skeleton before he was granted a University license of practice. As in the sixteenth century, fourteen years were required to

\[24\] Allen, op. cit., p. 119.  \[25\] Ibid., p. 121.
complete the study of medicine; but there was no improvement over that era's inadequate provision for clinical study. It is hardly surprising, therefore, that some of the better students travelled to the Continent to obtain their medical education, or gained practical experience as medical officers in the Army.26

Medical studies at Cambridge during the seventeenth century were governed by the Elizabethan Statutes of 1570. These Statutes were quite similar to the provisions of the Caroline Code. For example, they provided that "the lecturer in medicine shall read Hippocrates and Galen."27 Occasionally a professor who championed the "new philosophy" of Bacon and Descartes managed to inject some of their ideas into his lectures, but such teaching was definitely not prescribed in the statutes.

The Elizabethan Statutes and the Caroline Code, then, regulated the study of medicine in England, and as a result the Universities remained seats of a reactionary conservatism. In fact, the teaching of medicine in England up to the nineteenth century has been correctly described as a national disgrace.


27 Allen, op. cit., p. 122.

28 Sir Wilmot Herringham, "The Life and Times of Dr. William Harvey," Annals of Medical History, IV (March, 1932), 120.
The complacent conservatism of Oxford and Cambridge was strengthened by a complete lack of competition from other institutions of higher learning. The two principal Universities wielded enormous political power, and were able to eliminate virtually all competitors. They were able to prevent both Cromwell's University at Durham and the Royal Society from granting degrees.29

The best medical education available in England during the second half of the seventeenth century was that provided by the Dissenting Academies. These institutions, which were of university standing, had been founded after the Restoration when the Clarendon Code forced nonconformists out of the Universities. Within the space of thirty years, more than twenty-five of these Academies came into being. While most of the students who attended these institutions became ministers, there were many who studied medicine and jurisprudence. Only in the Dissenting Academies might the student receive practical laboratory instruction as part of his regular course of study.30

Another important institution of higher learning in England was Gresham College. Sir Thomas Gresham, who had been Queen Elizabeth's financial agent, left a large proportion of his estate in trust to the city and the Mercers'
Company to endow an educational institution designed to serve the citizens of London. The statutes of this College permitted the Professor in medicine to deliver up-to-date lectures.

At the close of the seventeenth century the classicists were far from displaced. In fact, by statute they were still in full control of formal medical education in the universities. However, the more modern thinkers had managed to incorporate some of the new science into the curriculums, and during the eighteenth century this tendency gained momentum.

Many physicians in the early part of the sixteenth century were ecclesiastics. Linacre, for example, took orders late in life; and John Chambre, one of the founders of the Royal College, was a priest. During the Middle Ages, many of the surgeons had been members of holy orders. But in 1163 the practice of surgery was forbidden by the Council of Tours, and, consequently, the art of surgery declined. In sixteenth century England the standard of surgery was low indeed. Most surgeons were incompetent, many unqualified practitioners were to be found, and quackery abounded. Thomas Gale reported

31C. J. Jeaffreson states that Linacre's motive for taking holy orders before his death is unknown. He was certainly not a profound theologian. It is said that a short while before his death he read the New Testament for the first time, and so great was his astonishment at finding the rules of Christians widely at variance with their practice, that he threw the volume from him in a passion and exclaimed, "Either this is not the gospel, or we are not Christians." (A Book About Doctors, I, 21).
that at the Battle of Montreuil in 1544 there was "a great rabblemnt that took upon them to be chirurgions, some wore sowe-gelders, and some horse-gelders with Tinkers and Cobblers."32

At this time there were two groups of surgeons, the minor surgeons, or men "of the short robe," who were members of the Barbers' Company, and the master surgeons, the men "of the long robe," who belonged to the Guild or Fellowship of Surgeons. Thomas Vicary, Serjeant-Surgeon to Henry VIII, believed that if these two groups were united, it would be easier to make and carry out effective plans for the advancement and regulation of surgery. This union was brought about in 1540 by an act of Parliament. The negotiations leading to this union were probably carried on with difficulty, since the Surgeons' Guild, though small—it numbered only fourteen members—was very exclusive, and the social position of its members was much higher than that of the surgeons in the Barbers' Company.33 If the Surgeons were to join the Barbers, they would enjoy certain advantages, such as a hall, the privileges of a City Company, and a share in the considerable property possessed by the Barbers. On the other hand, the Barbers' Company would gain in prestige, and would also

33 Ibid.
strengthen its control over the Surgeons and their practice. None of the Barbers was allowed to perform any surgery or blood-letting, with the single exception of tooth extractions; nor, of course, was any surgeon allowed to perform "barbery." The Barber-Surgeons were further authorized to use the bodies of four executed criminals yearly for dissection.34

The formation of the Barber-Surgeons' Company is a landmark in the history of English surgery, and exerted a salutary effect on the teaching of anatomy in England. This discipline had been almost entirely neglected, and the quality of instruction was far below that prevalent on the Continent. The above-mentioned right of claiming four bodies each year for dissection was, therefore, a highly significant advance. Not only did it authorize dissection in England for the first time, but it also provided anatomical subjects for demonstrations and lectures.35

The teaching of anatomy was at first limited to lectures and demonstrations on the bodies from Tyburn. These occasions were known as "public anatomies," probably because the subjects were allotted to the Company by the State, but partly, perhaps, because the dissections were open to a limited number of visitors.36 Indeed, the public anatomies soon became

35 Ibid.
36 Ibid., p. 103.
one of the sights of London, and the United Company found it expensive to accommodate the crowds which attended. 37

Since these public anatomies were important functions, considerable care was exercised in choosing the subjects, and, as executions were quite numerous, a good selection was always available. Little physical damage was done by hanging. Indeed, so slight was the injury inflicted at Tyburn, the subjects often showed signs of life after being brought to the Surgeons' Hall. This evidently was a source of great annoyance to the surgeons, since in 1587 they issued an order that thereafter, when any body revived, "the charges aboute the same bodies so reviving shall be borne, levied, and susteyned by such person or persons who shall so happen to bringe home the Bodie." 38 After this, the subjects do not appear to have come to life again.

The public anatomies were held only four times a year, and each lasted for three days. The bodies were dissected systematically: the most perishable parts, the viscera, were considered first; next came dissection of the muscles and arteries; and finally, the bones, ligaments, and joints were demonstrated. Various benefactors endowed ancillary


38 Ibid., p. 274.
lectureships, so that the anatomies involved a visceral lecture, a muscular lecture, and an osteological lecture.\textsuperscript{39}

Great ceremony surrounded the holding of such a public anatomy. The Surgeons of the Company were expected to attend the lectures; and, if they were absent for more than two of the three days, they were fined. Later, however, leave of absence was granted on payment of a small sum.\textsuperscript{40} Great care was taken not only in choosing the lecturer, but also in providing for his material comfort. Two Masters and two Stewards of Anatomy were appointed to assist the lecturer. The Masters performed the dissection under the direction of the lecturer, and they were responsible for seeing that the knives, probes, and other instruments were clean and in good condition. They had the duty, also, of supplying a wax candle to illuminate the interior of the body.\textsuperscript{41} Until 1565, the Company of Barber Surgeons held a monopoly on the performance of dissections. After that time, however, Queen Elizabeth granted similar privileges to the College of Physicians and to Gonville Hall, Cambridge.\textsuperscript{42}

\begin{flushright}
\textsuperscript{39}\textit{Ibid.}, p. 248.
\textsuperscript{40}\textit{Lett, op. cit.}, p. 103.
\textsuperscript{42}Jessie Dobson, "The Anatomizing of Criminals," \textit{Annals of the Royal College of Surgeons}, IX (August, 1951), 112.
\end{flushright}
The education of the Surgeons, however, involved more than attendance at the public anatomies. Lectures on surgery were given once a week throughout the year. An attempt was made to teach some pathology, and care was taken to see that the apprentices acquired a certain degree of general education, and that they understood Latin. The apprentices were also required to undergo a thorough examination before they were accepted as members of the Company with the right to practice surgery. Special emphasis was placed upon "Certaine precepts for young students in Chirurgerie." The nature of these precepts is indicated by William Clowes' versification:

They that have learning without practice in the Art,
Do oft more hurt, than helpe, unto the greeved part.
So practice without learning, yee ought not to admit,
These two may not be separate, that are so duly knit.
There must be a dexterity, and a finenesse in working,
A quick remembrance, and a ready understanding.
He must be circumspect, and seeske to avoide all slaunder,
Not too covetous for money, but a reasonable demaunder.
Being good unto the poore, let the rich pay therefore,
So God will blesse they doings, and thou shalt have the more.

He must also be honest, and in living very upright,
To serve the Lord our God, must be his whole delight.
Avoiding all drunkennesse, and vile riot to detest,
Least he greef fit for nothing, but Bacchus belly feast.
Stedfast to hold without trembling or shaking,
Who worketh upon mans body, being unfaithful of the same,
Is fitter for the stable, than to cure the sicke or lame.


In his famous work, *The Anatomie of the Bodie of Man*, Thomas Vicary set forth a similar code for the surgeon. He stated:

Al Authors doo agree, that a Chirurgion should be chosen by his complexion, and that his complexion be very temperate, and all his members wel proportioned. And I doo note foure thinges most specially that every Chirurgion ought for to haue: The first, that he be learned; the seconde, that he be expert; the thirde, that he be ingenious; the fourth, that he be wel mannered.

Throughout this period of history, there was a definite separation between the social status of physicians and surgeons. This was not evident in the Physicians' Act of 1540, a document which defined medicine as including surgery and allowed the physician the right to practice surgery whenever he liked. It was not, however, customary for the physician to practice any surgery, and he usually arranged with a surgeon and an apothecary to be at his service. The essence of the distinct social cleavage between physicians and surgeons is indicated by the charge of a judge to his jury in the seventeenth century:

The plaintiff is a chirurgeon and indeed a member of the company named "The Masters or Governors of the Mystery and Commonalty of the Barbers and Surgeons of London." Now were the plaintiff a physician he could

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45 Complexion means disposition or habit of body.


not maintain an action for his fees which are given . . .
not as salary or hire, but as a mere gratuity which a
physician cannot demand without doing wrong to his
reputation.

But surgeons are of an inferior degree amongst the
professors of the healing art, and like the medici of
ancient Rome to whom they correspond, they may demand
their fees as of right, while the fees of the physi-
cians are by the laws of England but honorary—which
is indeed more for the credit and rank of this honor-
able body.\(^\text{48}\)

Such treatment naturally angered the Surgeons; and the
situation grew worse in 1616 when the College of Physicians
received a new charter which conferred several new privileges
upon them, notably that of being able to take proceedings
against anyone who administered "inward physic" and was not
a member of the College. The result was that scarcely a
meeting of the College passed without several Barber-Surgeons
being brought before it and fined. The Surgeons resented
this treatment, and they brought pressure to bear upon Parlia-
ment. As a consequence, the new charter was not ratified.

But this did not end the troubles of the United Company. Its
members now encountered difficulty in obtaining subjects for
dissection. They complained time and again that "Aliens,
fforeyners, Mountebanks, Imposters and Empiricks"\(^\text{49}\) had bribed
and corrupted the executioner, and had obtained bodies for
private dissection.

\(^{48}\) W. R. Riddell, "A Seventeenth Century Surgeon and his

\(^{49}\) Harvey Graham, *Story of Surgery*, p. 196.
The Company did continue to receive a proportion of the available bodies, however, for it continued to give public lectures on anatomy. But surgery was entering upon a new phase. New hospitals were being constructed all over London. They offered almost ideal opportunities for the study of practical surgery. Naturally, the Barber-Surgeons suffered by this development. They had had a monopoly on the teaching of surgery, but the traditional method which they used, public lectures on anatomy in connection with the dissection of four bodies each year, was obviously inferior to direct observation of surgical operations in the hospitals. Surgeons connected with the hospitals were very willing to teach surgery, requiring of students neither a bond of apprenticeship nor seven years of study. As a result, students preferred to go directly to the surgeons at St. Thomas's and St. Bartholomew's than to apprentice themselves to the Barber-Surgeons' Company.

This development was a severe blow to the Company. It tried to prevent this invasion of its traditional prerogatives, but to no avail. The Company had not been wealthy for a number of years, and its finances were constantly weakened by demands for loans from the government. By 1642 it was forced to declare itself bankrupt. 50 Later it was rehabilitated financially and became associated with the Periwigmakers' Company. But much of its functions were now taken

50South, op. cit., p. 209.
over by the hospitals. In 1702, the Governors of St. Thomas's officially recognized the system of teaching which had grown up haphazardly, and began to regulate it. They ruled that no surgeon should take more than three pupils at a time, nor might he take any of them for less than twelve months. In this way, despite the opposition of the Barber-Surgeons' Company, great medical schools came into being.

The Surgeons were becoming increasingly dissatisfied with their colleagues, the Barbers and the Periwigmakers. Their bitterest grievance was an annoying tendency of the College of Physicians to treat them as inferiors, unqualified to give "inward physic." The Surgeons felt that they would have a better chance of meeting the Physicians on equal terms if they were separated from the Barbers. As early as 1684 they had petitioned the king on this matter, but it was not until 1744 that they became sufficiently influential to secure a separation.51

CHAPTER II

APOTHECARY VERSUS PHYSICIAN

The sixteenth century witnessed a union between the Barbers and Surgeons. The seventeenth century, on the other hand, saw both the incorporation and the dissolution of the Apothecaries and the Grocers.

The Grocers had evolved from the Guild of Pepperers which had existed in the late twelfth century. In 1345 Edward III incorporated the Grocers, and in 1429, Henry VI granted them a Royal Charter. Twenty-six years later they assumed the duties of examining the drugs sold by the apothecaries.¹

In 1606 the Apothecaries were incorporated with the Grocers,² but in 1615 the former petitioned James I to grant them a separate corporation. Perhaps a realization of the need for special care and training in the safe dispensation of medicines induced Theodore de Mayerne and Henry Atkins, both of whom were physicians to James I, to agitate for the separation of the two groups, and to secure for the Apothecaries a separate charter in 1617 under the corporate name of


"The Masters, Wardens, and Society of the Art and Mystery of Apothecaries of the City of London." Three factors contributed to the acceptance of their proposals. First, James I was a staunch supporter of the Apothecaries because Gideon de Laune, an early Master of the Society, was the apothecary to his consort, Anne of Denmark. Second, upon receiving the petition of the apothecaries for separation from the Grocers, James immediately turned the matter over to the Law Officers of the Crown, Sir Francis Bacon and Sir Henry Yelverton, who were to confer with the leaders of the Apothecaries and report to James. Bacon did not hold physicians in general in high regard. He and Yelverton, therefore, recommended the separation of the Apothecaries from the Grocers and also made the suggestion that it would be more logical to associate the former group with the physicians. James replied that the new Company should retain the precedence which it had held as a part of the Grocers' Company. When the charter was drafted the Apothecaries were made subservient to the physicians; but amendments, which were urged by Sir Francis Bacon, permitted the Apothecaries to manage their own affairs.

The charter conferred upon the Apothecaries the monopoly of keeping an apothecary's shop and rendered the following

3W. A. Furrington, "The Evolution of the Apothecary," Medical Record, XXX (September 11, 1886), 281.

4Barrett, op. cit., p. xviii.

5Underwood, op. cit., p. 1189.
practices and procedures unlawful for the grocers or for any other persons:

... to make or sell, to compound, prepare, give, apply or administer any medicines or medicinable compositions, or by any other way to use or exercise the Art, Faculty, or Mystery of an Apothecary or any part thereof, within the City of London and the suburbs or within seven miles of the City.6

The Grocers, meanwhile, bitterly resented the separation of this group from their organization, and, growing jealous of the prosperity of the new Society, in 1622 petitioned the King to take away the Apothecaries' charter and return the group to the Grocers' Company where it rightly belonged.7 James, however, was adamant and said:

The Grocers... are but traders. The Mystery of these Apothecaries were belonging to the Apothecaries wherein the Grocers are unskilful, and therefore I think it fitting they should be a Corporation to themselves. They [the traders] bring home rotten wares from the Indies, Persia and Greece, and here with their mysteries make waters and sell such as belonging to the Apothecaries and think no man must control them because they are not Apothecaries... many Empiricks and unskilful and Ignorant men and unexperienced do inhabit and abide in our City of London and the Suburbs and are not well instructed in the Art and Mystery of the Apothecaries, but are therein unskilful and rude, and do make and compound many unwholesome, hurtful, deceitful, corrupt and dangerous medicines, to the great peril and daily hazard of the lives of our subjects.8

To become an apothecary it was necessary to serve eight years with a master. The apprentice was required to pass an

7Sir William Wilcox, "President's Address," Proceedings of the Royal Society of Medicine, XXXIII (December, 1939), 101.
8Thompson, op. cit., pp. 180-181.
examination in the rudiments of Latin and to show that he could decipher the very illegible script in which the physicians wrote their "bills." Practical knowledge of herbs was also deemed necessary for the apothecaries, and botanical excursions, or "herborizings," were begun in 1627. Stewards were appointed to arrange for these "Simpling days," as they were called, and great importance was attached to these excursions.

Throughout the history of the Society of Apothecaries, relations with the physicians were never marked by great cordiality. In 1540 a Doctor Bulleyn, who is said to have been a cousin of Anne Boleyn, described the work of the apothecary and his relation to the physician as follows:

The apothecary must first serve God; foresee the end, be cleanly, and pity the poor. His place of dwelling and shop must be cleanly, to please the senses withal. His garden must be a hand with . . . herbs, seeds and roots. He must read Dioscorides. He must have his mortars, stills, pots, filters, glasses, boxes, clean and sweet. He must have two places in his shop, one most clean for physic and the base place for chirurgic stuff. He is neither to decrease nor diminish the physician's prescriptions. He is neither to buy nor sell rotten drugs. He must be able to open well a vein, for to help pleurisy. He is to meddle only in his own vocation, and to remember that his office is only to be the physician's cook.

The apothecaries, however, were not content to remain "the physician's cook." They bore little resemblance to the half-starved character in Romeo and Juliet whom "sharp misery

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9Ibid., p. 183. "Bills" were prescriptions.
10Willcox, op. cit., p. 100.
had worn... to the bones,"^{11} for in the early part of the seventeenth century they appear to have gained a reputation for making excessive profits on the sale of drugs and medicines. After they became a separate corporation and improved their status, they increased their charges to such an extent that the physicians grew jealous of their general prosperity and resented the monopoly that had arisen in the sale of drugs.

A wordy battle ensued, which lasted throughout the seventeenth century. The charter of the Apothecaries had provided that the rights of the College of Physicians should not be abridged, that the College should exercise a certain supervision over the Company, and that the apothecaries should consult the physicians on the uses and properties of medicine.\(^{12}\) The physicians further enacted by-laws forbidding admission of any of the following to their group:

... surgeons, drug-compounders, or any other artificers of that sort, lest, perchance, if such men be admitted into the college we may seem not to have sufficiently consulted our own dignity or the honor of our country's universities, which, however, we ought, and we always desire, to attend with the deepest veneration.\(^{13}\)

Evidently this snub did not disturb the apothecaries, and the physicians then resorted to the publication of books and pamphlets which condemned the apothecaries for rapacity


\(^{12}\)Purrrington, op. cit., p. 281.

\(^{13}\)Ibid., p. 282.
and complained especially of their charges to the poor.\textsuperscript{14}

In 1656 a book was published entitled \textit{The Honest Apothecary and the Skilful Surgeon}. Here the superior knowledge of the physicians was extolled, and this statement was made:

\begin{quote}
It is indeed fortunate that the little apothecaries and prescribing surgeons have not much knowledge of the great medicines, such as mercury and antimony, as they would at most times do great mischief with them. Such medicines should only be used by the physicians, who should reserve them in secret.\textsuperscript{15}
\end{quote}

In 1669 Christopher Merrett published \textit{Dr. in Physick}, which charged the apothecaries with falsifying their medicines and increasing the number as well as the prices of the prescriptions. He also vigorously denounced the administration of medicines contrary to prescription, the loading of medicines with honey or other cheap ingredients, and the use of decayed drugs.\textsuperscript{16} Following this attack, Doctor Gideon Harvey, in 1670, published \textit{The House Apothecary}, in which he attacked the apothecaries for their extortionate charges and recommended that his readers buy their drugs from the chemist and then prepare their medicines themselves.\textsuperscript{17}

This dispute reached its acme in 1699 when Sir Samuel Garth published his mock heroic poem, "The Dispensary," in which the quarrels between the physicians and the apothecaries

\textsuperscript{14}Thompson, \textit{op. cit.}, p. 191. \textsuperscript{15}\textit{Ibid.}, p. 198.


\textsuperscript{17}Thompson, \textit{op. cit.}, p. 197.
were recounted and the supporters of the latter were subjected to ridicule. Garth had written "The Dispensary" in defense of his proposal to supply the poor with medicines at cost, and its publication brought forth a number of pamphlets from the apothecaries and physicians, each writer defending his own group. The "Dispensarians," a group of physicians who agreed with Garth, accused their colleagues of playing into the hands of the apothecaries by prescribing unnecessary medicines, thereby increasing the physicians' income, since a fee was charged for each prescription.

Alexander Pope supported his friend Garth and made this contribution to the argument:

So modern 'pothecaries taught the art,  
By Doctors' bills to play the Doctor's part.  
Bold in the practice of mistaken rules,  
Prescribe, apply, and call their masters fools.

Although the apothecaries were castigated for their excessive charges, the same complaint was levelled against the physicians. Sir Theodore Mayerne was worth £40,000 pounds when he died; John Radcliffe's fees are said to have amounted to at least £4,000 pounds a year; and Sir Richard Mead is reported to have made from £5,000 to £6,000 pounds yearly from his practice.

The high fees charged by physicians were connected with changes in their social status—changes which required

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18 Ibid., p. 276.  
19 Ibid., p. 277.  
20 Ibid., p. 198.  
21 Ibid., p. 201.
larger incomes. Early in the seventeenth century, for example, coaches became necessary to respectability. These "hell-carts," as they were popularly termed, were derided by the public; nevertheless a man of distinction must own this vehicle. By 1670 it was customary for physicians to make their visits in carriages, and they then began to expect a double fee from their patients.  

By the days of Queen Anne, physicians had become more ostentatious in their mode of transportation. Now they had to ride in gilt carriages and have two running footmen. Outstanding practitioners, such as Radcliffe and Mead, usually had six horses drawing their coaches, and no less than four was the customary rule. The up-keep of all this naturally resulted in higher charges, and the general populace could not afford to pay the fees demanded by the physicians. It was not surprising, therefore, that many of the general populace, particularly the poor, turned to the apothecary for medical advice. The latter's reputation was enhanced during the Great Plague of London in 1665, for then the president of the Royal College of Physicians and most of the fellows of the College followed the example of their wealthy patients and fled from London. The task of caring for the sick, poor, and other people who stayed in the city was left to the

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apothecaries, and, consequently, their position as general medical practitioners was strengthened. Some of the fellows of the Royal College of Physicians, on their return to London when the danger from the plague had safely passed, found, to their great dismay, than many of their patients had been lost to the apothecaries. Another outcome was that the right of the apothecaries to visit patients in their homes became tacitly recognized and established.

In 1703 the disputes between the apothecaries and physicians were settled in the House of Lords when the case of William Rose versus the College of Physicians was tried and settled in favor of the apothecaries. In this test case, William Rose, an apothecary, was charged with giving advice and treatment to a patient without calling in a physician. He was convicted in the courts for this act, and the Society of Apothecaries took the case to the House of Lords where the verdict was reversed. The House of Lords declared that "both custom and the public heed required that Apothecaries should be allowed to advise their clients as well as to treat them." This decision is known as the "charter of the general practitioner."

Thus the apothecaries emerged victorious in the battles with the physicians. The refusal of the physician to


25 Ibid.
dispense his own medicines, the requirement of a fee of at least a guinea for his advice, and the expense and definite inconvenience to patients, especially those who lived in the country, of being required to call on the physician and the apothecary, and possibly even the surgeon, during the course of a single case—all were reasons enough why, in the course of time, the supplier of the drugs also was consulted as to their use.

It must not be imagined, however, that all apothecaries were virtuous persons, intent upon helping people. That questionable persons dispensed drugs is shown quite clearly in the murder of Sir Thomas Overbury.

The circumstances surrounding the imprisonment and murder of Overbury were mysterious. He and Rochester had been close friends, but when the latter disclosed his plan to marry Lady Essex, his paramour, Overbury protested vigorously. Apparently Overbury was in a position which enabled him to cause considerable disturbance and embarrassment. Perhaps he knew too much. At any rate his presence was inconvenient. James was induced to offer him a diplomatic appointment, which Overbury refused. Since there seemed to be no other way to deal with him, he was, on a trumped up charge, imprisoned in the Tower. But even this did not satisfy those who feared him. Lady Essex consulted an apothecary named Franklin and asked him to provide "that which should kill a man presently, but should lie in his body a certain time, wherewith he
might languish away little by little."26 Franklin furnished some "aqua fortis" which was tried on a cat. The animal suffered several days and then died. But Lady Essex felt that this poison was too strong, and the two decided to experiment with other lethal poisons. Franklin supplied "arsenic, Lapis Costitus, Mercury Sublimate, Cantharides and Great Spiders,"27 and Lady Essex dispatched a constant stream of poisoned delicacies to Overbury, usually in Rochester's name, such as tarts and jellies which contained arsenic and mercury sublimate, and partridges which had been seasoned with lapis costitus. All these things were delivered in the most casual manner, by anyone who happened to be going in the direction of the Tower. One basket of tarts was taken there by a musician named Simon Merston, who described himself as "somewhat liquorish,"28 and he experienced great difficulty in keeping the syrup from running over the edges of the tarts. In an attempt to prevent this, he scooped off a little of the syrup with his fingers and then licked them. A few days later most of his hair dropped out and he lost several of his fingernails. It was not until a much later date, however, that he connected the two circumstances.

26 William McElwee, The Murder of Sir Thomas Overbury, p. 82.
27 Ibid., p. 93.
28 Ibid., p. 123.
Elwes, the jailer, suspected the plot, and most of the gifts were kept away from his prisoner. But Lady Essex was not to be denied. Although her poisoned food had failed, there was yet another means. She heard that Overbury was ill and that an apothecary named de Loubell and his apprentice, William Reeve, were the only permitted visitors. Through Franklin she contacted Reeve and offered him twenty pounds for his cooperation. He took the money and agreed to put sublimate of mercury, a deadly poison, in the next "clyster," or enema, administered to Sir Thomas. Reeve made a death-bed confession of the murder plot. Franklin, the apothecary, was beheaded for his participation in the crime, but Lady Essex was given her freedom.
CHAPTER III

HOSPITALS

Throughout English history the care of the sick poor had been in large part the responsibility of the monastic orders. One of the most deplorable results of the dissolution of the monasteries in the sixteenth century was the abolition of the hospitals and almshouses maintained by the monks for the care and treatment of the indigent. This led to a great increase in the number of vagrants and beggars who roamed the streets, yet it also paved the way for the rise of the major London hospitals.¹ It is, perhaps, possible to place too much emphasis on the break-up of the monasteries in accounting for the rise of secular hospitals and almshouses. It has been stated that the growth of secular hospitals in England was in reality a parallel of the same evolution that was occurring on the Continent.²

Nevertheless, the immediate effects of the closing of the monasteries led to much disruption in the care of the sick poor. Sir Thomas More in his Supplication of Souls exposed


this short-sighted policy, but Henry VIII ignored his advice, and by 1539 the number of hospitals which had been closed totaled 110.3

The Corporation of London was apprehensive of the consequences of Henry's action, and in 1538 Sir Richard Gresham, the Lord Mayor, appealed to the monarch to place at the disposal of the Mayor and the aldermen the Abbey of Tower Hill and the three remaining hospitals—St. Mary's Spital, St. Bartholomew's, and St. Thomas's—together with their revenues. The petition stated what would be done in the city hospitals:

... A great number of poor, needy, sick and indigent persons shall be refreshed, maintained, and comforted; and also healed and cured of their infirmities frankly and freely by physicians, surgeons and apothecaries, which shall have stipends and salaries only for that purpose; so that all impotent persons not able to labour shall be relieved, and all sturdy beggars not willing to labour shall be punished.4

Nothing was done, however, until 1544, when Henry re-founded St. Bartholomew's Hospital, although he afterwards resumed possession of it. Henry's physicians stated that the only time the King would listen to reason was when he became ill.5 During his final illness and before his death in 1547, Henry made the comprehensive agreement with the


5MacNalty, op. cit.
citizens which led to his posthumous, even though unmerited, distinction as the founder of the five "Royal Hospitals"--St. Bartholomew's, St. Thomas's, Christ's Hospital, Bethlem Hospital, and Bridewell.

Henry had proposed granting to the City of London the Mansion House of St. Bartholomew's, the dissolved house of the Grey Friars which adjoined it, and the then unoccupied buildings of St. Thomas's Hospital. He had also intended to rename St. Thomas's the Hospital of the Holy Trinity, which was to be used only for wounded and ill soldiers. The former house of the Grey Friars was to be used for the care of fatherless children and those of poor parents. Henry's intentions were apparently good, but he died before he could fulfil all of his plans; only St. Bartholomew's and Bethlem had been given to the citizens of London.6

Actually it was through the efforts of the City Corporation that these hospitals were preserved. E. G. O'Donoghue forcibly states this fact when he says:

But it cannot be too plainly, or too often, stated that it was not the charity of the king, but the charity of the citizens of London, which founded the five "royal hospitals" after the Reformation.7

The final results were that two of the institutions were

6Stone, op. cit., p. 6.
7E. G. O'Donoghue, Bridewell Hospital, Palace, Prison Schools, From the Earliest Times to the End of the Reign of Elizabeth, pp. 130-131.
hospitals in name only. Christ's Hospital was a home for poor, fatherless children, and Bridewell was a workhouse for the lazy and the dissolute.

Christ's Hospital and Bridewell were granted to the City of London during the reign of Edward VI. Shortly after Edward became king, Richard Grafton, printer of the Book of Common Prayer, became disturbed about the amount of pauperism in London and the number of poor who roamed the streets of the city. He discussed the problem with Ridley, the Bishop of London, who also evinced an interest in social conditions. In 1552 Ridley preached for the King at Whitehall, and he emphasized the necessity of making some provision for the poor. Edward discussed the matter with the bishop and then wrote to the Lord Mayor of London for advice on the situation.

At this time the area which was to comprise Christ's Hospital was covered by the semi-ruined buildings of a former convent of the Grey Friars. St. Thomas's Hospital, which was owned by Sir John Gate, was in a dilapidated condition. The city proposed to convert the former convent buildings into a home for fatherless children and to restore St. Thomas's as a hospital. These plans promised to solve some of the city's problems, although the pressing social problem of what

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8Sir Humphrey Rolleston, "History of Medicine in the City of London," *Annals of Medical History*, III (January, 1941), 17.

9O'Donoghue, *op. cit.*, p. 130.
to do with the vagrants, rogues, and dissolute women who roamed the streets of London perplexed the city fathers. They finally decided to ask the King for the Royal Palace of Bridewell. This palace, however, was not the personal property of Edward, and it was necessary to consult his ministers before a transfer could be made to the city. Finally on June 26, 1553, the "Charter of Edward VI of the Hospitals of Christ, Bridewell and St. Thomas the Apostle" was granted the City of London.¹⁰

These three hospitals were chartered by Edward VI, but the young monarch should not be given full credit for their establishment, particularly in the case of St. Thomas's and Christ's hospitals. He signed their charters upon the recommendations of a council of regency, just as he did for a number of grammar schools which bear his name. His only personal gift was a grant of linens of Christ's Hospital, and these linens were said to be the "spoils of the vestries of the city churches."¹¹

Of the remaining Royal Hospitals, St. Bartholomew's is the most famous. This ancient hospital was founded in 1123 by Rahere, a monk. According to the story, Rahere, while experiencing a severe attack of malaria, had a vision of St. Bartholomew, who commanded him to found a church in his name.

¹⁰ Underwood, op. cit., pp. 1185-1187.
¹¹ O'Donoghue, op. cit., p. 131.
Having earlier made the vow to found a hospital for the sick poor, Rahere now proceeded to obey the Saint's command and to fulfil the pledge. Henry I granted him land from the Crown property, and St. Bartholomew's, the oldest hospital in England, came into being.\textsuperscript{12} It continued as a small institution dedicated as a rest home for the sick poor until Henry VIII was excommunicated. Then St. Bartholomew's, along with the other ecclesiastic houses, was confiscated by the Crown.

When the hospital was closed it possessed an income of about eighty-five thousand dollars a year.\textsuperscript{13} In 1538 Henry, "our most redoughted puyssant and myghty prynce, our most drad beloved and naturall sovereign lorde,"\textsuperscript{14} was petitioned to return St. Bartholomew's to the city, but more than five years elapsed before any action was taken. During this time Henry upbraided the citizens with being "pynche-pence" or stingy in the matter of compensation to the king; and there the matter stood, Henry hoping that delay would produce a higher bid.\textsuperscript{15} Finally he did restore the hospital

\textsuperscript{12}Harvey Graham, \textit{The Story of Surgery}, p. 105.


\textsuperscript{14}Norman Moore, \textit{The History of St. Bartholomew's}, II, 149-159.

\textsuperscript{15}E. G. O'Donoghue, \textit{The Story of Bethlem Hospital From Its Foundation in 1247}, p. 111.
to the city along with half of its funds; the citizens of London were required to raise the rest of the money.

When the City of London took over the hospital, very definite rules were made concerning the conduct of the institution's affairs. There were twelve governors of the hospital, of whom four were aldermen and eight were persons taken from non-official positions. Next a "Hospiteler" was appointed, whose duties were similar to those of a modern hospital manager. The "Hospiteler" also exercised the functions of a chaplain, for he was instructed to do the following:

... chiefly and most principally to visit the poor in their extremes and sicknesses and to minister unto them the most wholesome and necessary doctrine of God's comfortable words, as well by readyng and preaching as also by ministring the sacrament of the holy Communion at tymes convenient. 16

Another official of the hospital was the renter, since most of St. Bartholomew's income was derived from property. The butler, or steward, the cook, and the porter were also important members of the staff. The latter was not only directed to watch the doors of the hospital, but also, during the summer, he was expected to make the rounds of the wards at seven in the evening to see that everything was in good order and that prayers were said. Additional instructions were as follows:

And whatsoever poore persone shal be founde a swearer or an vnreverent user of his mouth, toward God or His holy name, or a contemptner of the Matron or

16 Moore, op. cit., p. 170.
other officer of this house, or that shall refuse to go
to bedd at the lawful houres before appointed, hym shall
ye punyshe (after one warning given) in the stockes, and
further declare his folie vnto the Almoners of thys
house that they male take suche order with him or them,
as shal seme meet by their discretions.\textsuperscript{17}

Three surgeons were employed by St. Bartholomew's. Each
patient who was brought into the hospital was examined by two
of the surgeons; they made a diagnosis and a prognosis and
then reported to the Hospiteler, who recorded their findings.
It was the surgeons' duty to decide whether a patient was
curable, for the policy was to admit only those whose recov-
ery was considered probable. Also, before a patient could
leave the hospital, he had to be examined and approved by
two of the surgeons. No physician was appointed to the hos-
pital in the early days. It is probable that the governors
felt the financial condition of the hospital was not such as
to warrant the expense. By 1568, however, a physician was
obtained. Doctor Roderigo Lopus, who was later sentenced to
death for high treason, was the first person to fill this po-
sition, and among his successors were such illustrious per-
sonages as Timothy Bright and William Harvey.

The beadles also constituted an important group of hos-
pital employees, apparently functioning as a sort of human
ambulance. Their duty was to walk the streets of London,
two by two, watch for accidents, and convey the injured indi-
viduals to the hospital and into the hands of the surgeons.\textsuperscript{18}

\textsuperscript{17}\textit{Ibid.}, pp. 175-176. \textsuperscript{18}\textit{Scammon, op. cit.}, p. 744.
They were also ordered to keep a watchful eye on discharged patients, preventing the latter from counterfeiting illness or from begging. Furthermore, they were to prevent sturdy beggars from asking for alms within the city and its suburbs.\(^{19}\)

The nursing staff consisted of from twelve to fourteen people headed by a matron or chief nurse. Careful rules were laid down in regard to their conduct; the matron, in particular, was instructed not to "partake of strong waters,"\(^{20}\) and this admonition was also given to her:

> Suffer no poore persone of this house to ... drynke within your house at no tyme, neyther shall ye so sende them drynke into their wardes, that thereby dronkenness myght be used and continued among them, but as much as in you shal lie, ye shal exhorte them to vertue and temperannce, declaring this house to be appointed for the herboure and succour of the dere members of Christes body, and not of dronkardes, and unthankful persones.\(^{21}\)

Four books were kept—a journal, which recorded daily events; a book of accounts, which was a sort of inventory; a repertory book, which was a daily account; and a survey or summary. Among the precautionary measures taken to assure the integrity of hospital affairs was this ruling:

> There shall be provided a fair and substantial chest which shall be located in the securest part of the hospital, and this chest shall have three separate locks, each with a different key. One shall be in the hands of the president, one in the hands of the treasurer, and one in the hands of a commoner elected by the people, and all record books shall be kept in this chest,


\(^{21}\)Moore, *op. cit.*, pp. 172-173.
and none shall be opened without all three officers being present, and no record shall be removed from the chest, for any purpose none whatsoever.22

Theoretically, the gates of the hospital were freely opened to the poor; actually, to gain admission one had to have a Governor’s letter and nineteen shillings and sixpence as a burial deposit. While in the hospital the patient lay on a rug on the floor, and often his food was furnished by charitable passers-by in the neighborhood. When death occurred, the beadle received one shilling for a certificate, the bearers received two shillings to carry the body to the hospital gate, the matron received a shilling for a pall, and the steward received a shilling to certify that death had taken place.23

St. Bartholomew’s functioned also as a Poor-law infirmary or casual ward. The types of people taken to the hospital are described by Robert Copland, a printer and author who lived from 1508 to 1547, in his poem "The Hye Way to the Spytell Hous":

Forsooth they that be at such myschef,
That for their lyving can do no labour,
And have no frends to do them socour,
As old people, seke and impotent,
Poore women in childbed here have easement,
Weyke men sore wounded by great vyolence,
And sore men eaten with pockes and pestylence,
And honest folk fallen in great poverty,

22Scammon, op. cit.

By mychance or ther infirmity;  
Wayfaring men, and maimed soldyours,  
Have theyre relief in thyd poore hous of ours.  
And all others which we seme good and Playne,  
Have here lodging for a night or twayne.  
But not every unseke stoborn knave.  
For then we should over many have.24

Today, St. Bartholomew's is ruled by approximately the same constitution as the one the citizens of London established in 1547. The stewards, matrons, treasurers, beadles, renters, physicians, and surgeons are still a part of the life of the hospital. But in the twentieth century, as in the sixteenth, the citizens of London have failed to comply with one of the letters patent of Henry VIII. In these letters St. Bartholomew's was given the name, "The House of the Poore in West Smithfield, in the suburbs of the City of London, of King Henry the Eight's foundation."25 Although this name is used in legal documents, it has never attained any wider use. Today, as in 1123, St. Bartholomew's, or "Barts," continues under its ancient designation.

St. Mary of Bethlehem is another of the Royal Hospitals which has attained great fame and, in the light of twentieth century knowledge, infamy. The hospital had originally been founded in 1247, was confiscated by Henry VIII, and then was given to the city shortly before the monarch's death. In 1547 the hospital was designed an insane asylum, and it soon became

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24"Poor Law and Hospital Problems in the Sixteenth Century," Lancet, II (October 2, 1909), 1020.

known as Bedlam, "Which signified both the institution and
its inmates—and any row which partook of the nature of ei-
ther."26

The hospital was a center of attraction for the lusty
Elizabethans. In fact, a visit to it was a "must" for every-
one who lived in London or visited there. Anyone who paid
the small admittance fee was allowed in the hospital to watch
the "mad Toms and Besses" who were restrained there. This
form of amusement was popular even after the Restoration.
Samuel Pepys speaks of being visited in London by two young
cousins and says that "the young people went to see Bedlam."27
It is probable that the sights in this hospital inspired
Reginald Scot to protest against the burning and drowning of
witches on theological grounds. In his book, The Discovery
of Witchcraft, he diagnosed the element of insanity in the
witch and the bewitched, contending that a disordered
brain was responsible for the unaccustomed sensations and
the hearing of voices by these people. James I, in his
Demonologie, violently attacked this new and heretical
idea.28

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26 Herbert Silvette, "On Insanity in Seventeenth-Century
England," Bulletin of the History of Medicine, VI (January,
1938), 23.

27 Samuel Pepys, Diary, edited by Henry B. Wheatley, II,
pp.

28 E. G. O'Donoghue, The Story of Bethlehem Hospital,
p. 152.
Bedlam suffered from great neglect. It was supposed to share Bridewell's revenue, but the portion it received was meager. In 1557 the hospital dispatched a proctor who went on a begging mission for it. The funds received in this manner were also far from adequate, and the consequent neglect of the hospital produced such scandals that Charles I felt it necessary to investigate the institution. Lupton, describing a scene in Bedlam, stated that "it seems strange that anyone should recover here; the cryings, screechings, roarings, howlings, shaking of chains, swearing, fretting, and chafing are so many, and so hideous." 29

This would seem bad enough; but even worse was the manner in which the food supply was handled. In 1632 Charles's commission reported that the condemned meat of the markets, which had always been placed at the disposal of the hospitals as a gift to the patients, was not reaching its destination in that manner, for the steward and his wife were reserving the best pieces for themselves and selling the remainder to the patients at six times its value. Sometimes no food or drink was delivered to the hospital, and then the patients starved until food arrived. For example, when, in 1631, two of the governors paid a surprise visit to the hospital, they found that on the previous Sunday there had been only four pounds of cheese for the thirty patients to eat, and, also,

29 Ibid., p. 164.
that the steward's wife monopolized the fire and would not allow any of the patients near it.\textsuperscript{30}

The outcome of these investigations was a charter which Charles I granted to London, giving the city possession of the estates of the hospital and the management of its government. Charles was compelled to grant this charter to the city, for he needed money to wage a war in Scotland, and the City of London demanded redress of its grievances before raising a loan. Charles consequently deemed it the best policy to renew the ancient privileges and franchises of the city.\textsuperscript{31}

This, however, did not lead to any improvement in conditions at the hospital. The great fire in 1666 must be given credit for a change in the situation. Bethlehem escaped destruction, and the court was forced to convene in the hospital for a period of three years. This direct contact with, and observation of, the institution convinced the governors that Bethlehem was entirely inadequate, and in 1674 they recommended that it be removed and rebuilt elsewhere on a site granted by the city. In accordance with this recommendation, a building was designed by Robert Hooke, and the hospital was moved from Bishopsgate to Moorsfield.

Actually the hospitals were woefully inadequate for the task of caring for the thousands of sick people. The general

\textsuperscript{30}Ibid., p. 169. \textsuperscript{31}Ibid.
practice was to take the sick to the hospital only as a last resort; and then only the very poor, who were almost charges of the country and could not receive medical aid in their own homes, consented to go to the hospital. Not until the rise of the major hospitals in the nineteenth century and the development of Lister's principles of antisepsis did a change occur in the attitude of the populace toward hospital confinement.
CHAPTER IV

MILITARY MEDICINE AND SURGERY

The development in arms, tactics, and organization which occurred during the sixteenth and seventeenth centuries offers a fascinating field of study to the military historian. But to the medical historian the development of military medicine and surgery during this period is important because, for the first time, gunshot wounds became the ordinary type of battle casualty. It is true that cannons had been used sporadically since the time of Henry III, notably at the Battle of Crecy. But it was not until the sixteenth century that the use of gunpowder became common.¹

Gunshot wounds were a new development and challenge to the medical men of the day. The old remedies were ineffective in treating wounds made by bullets, and the formulation of new methods of care required the doctors to consider the basic causes of the unusual and appalling damage. The hypothesis stated by Jerome of Brunswick and John of Vigo was generally accepted and affected the treatment of injuries. They said that wounds were poisoned by the gunpowder and

¹H. A. L. Howell, "The Army Surgeon and the Care of the Sick and Wounded in British Campaigns During the Tudor and Early Stuart Periods," Journal of the Royal Army Medical Corps, II (May, 1904), 611-612.
were scorched by the great heat generated by the passage of the bullets through the air. Therefore, to counteract the effects of the heat and the poison, the wound must be cauterized. This was done by pouring boiling oil, mixed with a little treacle, into the wound. Another theory was based upon the belief in supernatural powers, and its advocates proposed the use of prayers, incantations, charms, and exorcism in the treatment of those who were wounded by the "devilish engines of warre." Ambroise Pare, the great French surgeon, pointed out the fallacy of these beliefs, but before his views became universally accepted the wounded soldiers suffered untold agonies in the treatment of their wounds. It was widely believed, also, to the great detriment of surgical practice, that no wound would heal satisfactorily without the formation of "laudable pus." This idea was not completely abandoned until the latter part of the nineteenth century.

Even though the notion of the poisonous nature of gunshot injuries was dispelled, treatment of the wounds remained quite complicated. This should occasion no surprise, for throughout this period of history there was a general feeling that an involved treatment of disease or injury would increase the possibility of a patient's recovery. Under the

guise of judicious management, therefore, varied treatment was given the wounded person. In simple wounds the edges were sutured, and a dressing compounded of egg white fortified with a substance known as "dragon's blood" was applied. But in the larger, more serious wounds, particularly in the case of those which involved the loss of much tissue, energetic measures were undertaken in treatment. Drugs, such as mastic and aloes, called sarscoptics, were used because they supposedly aided in re-forming the tissue. Then when the wound was filled with granulation tissue, drugs were employed to cause the tissue to cicatrize. Finally, if the wound was regarded as contused, as in the case of gunshot injuries, the use of digestives was necessary before anything else. These digestives were supposed to bring about suppuration as quickly as possible. One highly recommended preparation was composed of mallows, violets, and anthea, which were soaked together in fresh broth. Then barley flour, butter, basilicon, and egg yolk were added to the mixture. This concoction was applied to the wound, and, considering the nature of the preparation, there can be little doubt that it produced the desired result, suppuration, in record time.


\textsuperscript{5}Ibid., p. 233.
Since the use of gunpowder was a relatively new innovation, proper care was not exercised in its use. Many times it was set on fire accidentally, and gunpowder burns, often of a serious nature, became quite common. This is not surprising when one realizes that cartridges had not come into use and that cannons and muskets had to be charged with gunpowder which was not protected in any way. The powder for the artillery was stored in open barrels which were often handled carelessly in the field, and thus was frequently set on fire with resultant injury to the gun crews. The musketeer carried his powder and shot in a bandoleer—across belt from which was suspended about a dozen powder flasks, a bullet bag, and a primer. Each powder flask contained enough powder to charge a musket for one round of shot, and the primer contained enough powder for several discharges of the weapon. Firing a musket was not a simple process; lighted "match" was applied to the priming pan, igniting the priming powder which, in turn, exploded the propellant inside the musket and so discharged the weapon. Match, which was composed of rope that had been soaked in saltpeter and then dried, was of primary importance in this chain of action, but it was an ever present danger to the man who used it. Once ignited, it continued to smolder until it was used up. The soldier was well supplied with spare match, which was hung from the bandoleer, stuck in his hat, or wrapped around his body. Consequently, when a man fired his musket he might set both his powder and
himself on fire. It is not surprising that gunpowder burns were quite common and frequently of a critical nature.

The surgeons paid particular attention to the eschars that formed on the gun-shot wounds and caused great pain. Various remedies were employed to remove these crusts. A compound of marshmallows, violets, and parsley seeds was often used; one composed of quince seeds and mallows was recommended; and a mixture of egg yolk beaten up with oil of roses, barley flour, and bolarmery was considered effective. Another remedy was a dressing consisting of sheep dung, fried in lard until it had dissolved in the fat, and verjuice. Each of these preparations was applied to the wound on lint or linen soaked in oil of roses and egg yolk. 

This period presents a monotonous, dismal story of disease and death among the English soldiers. The high morbidity and mortality rates have been attributed to factors other than gunpowder wounds. Complaints were made about the poor quality of the men recruited into the army. For this, however, the medical service could not be blamed; the men were not given physical examinations before entering the service. Recruitment was carried on by voluntary enlistment and by impressment. Compulsion was often resorted to when the numbers gained by recruitment could not fill the ranks. Also, impressment provided additional income for many officers.

6Ibid., p. 235.
because the soldier could purchase his release from service. Falstaff, in *Henry IV*, gives this classical description of the procedure used to line his pockets and yet recruit foot-soldiers for the king. First, he impressed wealthy householders, well-to-do farmers, prospective bridegrooms, and other men who had not the slightest desire to be dragged off to the wars. Then he permitted them to purchase their freedom at the price of several pounds each. After pocketing the money, he filled his now depleted ranks with tramps, rogues, and poor, undernourished men who did not have the money to pay him off. The final result was that he had "a hundred and fifty tattered prodigals," of whom he was so ashamed that he marched them around Coventry rather than let the townspeople see the pitiful collection of humanity he had gathered together.

It was customary for the authorities of a county, when ordered to make a levy for the army, to round up all of the undesirables who were at large in the district and to release criminals from jail so that the quota would be filled. The county was also largely responsible for arming, equipping, and clothing the recruits. This imposed a costly burden on the districts; the local authorities consequently tended to skimp their duty, and the men were sent off on active service.

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both badly armed and inadequately clothed. It is not surprising, therefore, that army officers complained of the poor quality of the recruits. Nor is it surprising that there was a general belief that new recruits were more susceptible to disease than soldiers with longer service.8

The poor health of the troops was also commonly connected with their pay, which was either so inadequate in amount or so far in arrears that the soldiers were unable to purchase food. Insufficient pay was the soldiers' chief complaint in the early part of the sixteenth century, but the slow rate of payment during Elizabeth's reign was their grievance then. Queen Elizabeth, who was never overburdened with money, always had difficulty in meeting her financial obligations, and she was further hampered by the flagrant dishonesty of her army officers. Many of these men kept the soldiers' pay for themselves, complaining later about the poor conditions under which their troops had to live because of lack of money.9

Prompt and regular payment of the soldiers was of primary importance during this period, for those serving in the army were required to buy their own food and other supplies. Toward the end of the sixteenth century the situation was improved when the government gave contracts to private

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9Ibid., p. 37.
persons to supply army rations. Elizabeth evidently hoped that this action would reduce expenditures, for the rations were supplied in lieu of part of the wages.\textsuperscript{10} The complaints about the lack of money became less frequent, but their place was taken by criticism of the quality of the rations supplied by the purveyors. Indeed, many officers felt that the quality of the food was largely responsible for the ill-health of many of the soldiers.\textsuperscript{11}

Clothing, or rather the lack of it, was another important factor contributing to disease among the troops. The clothing usually arrived long after it was due and was of poor quality. The soldiers were frequently in rags and almost without any clothes at all.

Pay, food, clothing, and the vagaries of the weather—all had an influence on the morbidity and mortality rates of the army, but it is doubtless true that their effects were exaggerated. The health of the troops at this time was just as good as it was in the middle of the nineteenth century. The main factor was that medical science had not yet discovered how to protect the men from the ever recurring diseases incident to life in the army.

\textsuperscript{10} Howell, \textit{op. cit.}
But though little could be done to protect the soldiers from disease, the government did begin, in the sixteenth century, to recognize its obligation to the sick and wounded in the army. In earlier times no policy had been established for the care of men when they became casualties. The government did not assume any responsibility for their welfare or recovery. Men so incapacitated that they could not be ready for service again in a short time were simply discharged from the army. If able to travel, these men made their own way home; if they were not, their care was left in the hands of the civil population. Here they either recovered or died; the English government felt that it was not under any obligation to provide for the treatment of a discharged soldier.

The injustice of this policy is evident. Certainly it worked great hardships on soldiers wounded in battles conducted within the limits of Britain, but the situation was much worse for those who fought abroad and were left, sick or wounded, separated from home by a body of water, among a people speaking in a foreign tongue.

It has frequently been asserted that the seriously wounded were disposed of in a much simpler manner, in a way that caused no trouble or expense to the government, that, in short, their throats were cut. It has been stated that the dagger called the misericorde was so named because it was used for putting the wounded out of their misery. Probably there were isolated instances of commanders ordering
this type of slaughter, but no doubt such action was rare. That it was the usual practice even in the Middle Ages is improbable.  

In the first part of the sixteenth century there was little improvement in the care given the sick and wounded. However, an attempt was made to prevent healthy individuals from getting out of service on the pretext of illness. During the campaign of 1544 the Privy Council levied bitter complaints against the Duke of Norfolk, charging that many men perfectly fit for service were being shipped back to England. Henry VIII even accused Norfolk of using the disability excuse as a means of reducing the numbers of his troops, thereby forcing the Duke's recall.

Although Norfolk and his colleagues repudiated the charge, there is evidence to suggest that Henry's accusation had some foundation. Following the failure of the siege of Montreuil, Norfolk retreated to Calais and remained there, although he was continually urged from home to go to the relief of Boulogne. During his stay in Calais a large number of the troops, many merely pretending illness, made their exodus from the Continent. Little blame can be placed on the soldiers, for there was a severe outbreak of dysentery, so severe, in fact, that men died in the streets. It is not

surprising that the men took the first chance to escape from the place and frequently, on the pretext of disability, managed to be sent home. Norfolk was aware of this problem, but he believed that the sick men would recover if they were sent back to England. He appointed a committee whose duty it was to oversee the evacuation and to prevent any healthy men from leaving Calais. This committee was composed of non-medical men and did not, perhaps, perform with great efficiency. At any rate, many malingerers slipped through their fingers.

The theory has been advanced that Norfolk appointed this committee only as a blind which would enable him to state that he had taken all possible steps to prevent fit men from deserting, although in reality he placed no obstacles in their path.

No matter what may have been the underlying motive for the establishment of Norfolk's committee, it was, nonetheless, the first time a body had been set up to direct the evacuation of the incapacitated. But, as in previous years, the government felt it had no further concern for the welfare of the soldier.

During the reign of Elizabeth the unfortunate state of the wounded or diseased soldier became quite obvious to the English people, for the troops were actively engaged in war on the Continent, and many incapacitated soldiers returned
to England. It was at last realized that the country was under a certain obligation to the men who had suffered injury in the service of their country. This humane feeling was reinforced by practical considerations. Many of the soldiers were found to be unfit for further army service after they had received treatment, and they were discharged from the army. Having no money which would enable them to proceed to their homes, they were forced to remain in London; and by the 1580's that city had a large number of these incapacitated men roaming the streets, supporting themselves as well as they could, some resorting to begging or to acts of crime. It became clear, if only to prevent a public scandal, that something had to be done for this group of men.\(^{14}\)

In 1586 the Privy Council told the Lord Mayor of London and the Justices of the Peace of Middlesex to have all disabled persons, who were at that time begging in the streets, examined. Then they were to ascertain which ones of these had received their injuries in the wars and which had not. The former were to be given enough money to enable them to return to their own homes. To raise the necessary amount for this undertaking, the Bishop of London requested all clergymen to take up collections on behalf of the ex-soldiers. This was only a stop-gap method, however, and in 1593 Parliament passed an act which gave the county officials

\(^{14}\text{ibid.}, p. 36.\)
the power to raise money for use in the maintenance of totally disabled soldiers and seamen who had received their injuries after March 25, 1588.15

Although military medicine of the seventeenth century showed little advance over that of the sixteenth century, several developments are worth noting. The French invented the flint musket in 1635, and the bayonet in 1640, producing obvious complications in the treatment of wounded soldiers, and the army surgeon acquired a distinctive uniform.16 The uniform indicated a non-combatant status, although as early as the reign of Elizabeth an order had been given that "surgeons must wear their baldric, whereby they may be known in time of slaughter; it is their charter in the field."17

During the Civil Wars the medical personnel seems to have been treated as non-combatants by both sides. They frequently were allowed to treat the wounded who had been captured by the opposing forces, and when captured themselves they were not usually held as prisoners.18


16F. H. Garrison, Notes on the History of Military Medicine, p. 121.

17"The Army Surgeon in Cromwell's Time," Medical Record, LXII (September 6, 1902), 3791.

The number of doctors available during this period of conflict was limited. And as the fortunes of war changed, there were changes also in the type and amount of medical service which the opposing forces received. The Royalists had the more competent medical personnel when the Wars began. Later, when the Parliamentarians secured control of the government and the treasury, they were the better supplied. Throughout this time, however, much of the care of the wounded fell upon the local practitioners. It was also customary to supplement the services of the army doctors, particularly in important cases. When Skippon was wounded at Naseby, Parliament employed a special physician to treat him; and when Cromwell became ill in Scotland in 1651, Parliament sent two leading practitioners, Doctor Wright and Doctor Bate, to Edinburgh.

An attempt was made to collect and remove the wounded from the field of battle, and the proponents of this plan justified it as follows:

It were convenient to appointe certaine carriages and men, of purpose to give their attendance in every skirmishe and encounter to carry away the hurte men to such place as surgeons may immediately repaye unto them, whiche shall not only greatly incourage the soldiour, but also cause the skirmish to be the better maintained, when the soldiours shall not neede to leave the


20 "The Sick and Wounded in the Parliamentary Civil War," *op. cit.*
fielde to carry away their hurte men. These were called among the Romans 'Despotati.' And this among other laudable Roman orders have the Spaniards at this day revived and put in practice, whereby also they conceal from the enemie what losses in any skirmishe they have received. 21

But this did not become standard procedure for collecting the wounded. Frequently they were left on the field to be picked up later by the people of the surrounding countryside. Officers, however, were shown more consideration, and were usually taken to the home of someone close by, where the lady of the house was requested to dress their wounds. At such times political considerations were not an issue, and Mrs. Hutchinson, the wife of the Parliamentary governor of Nottingham, dressed the wounds of Royalist soldiers as well as those of the Parliamentarians. 22

Although there was nothing resembling a field hospital, and the care of the wounded naturally devolved upon the people in the area of the fighting, Parliament did make attempts to cope with the problem. After the Battle of Naseby the wounded were collected, doctors were sent from London to care for them, and the claims of the people in whose homes the wounded had been lodged were paid by Parliament. 23 Also, after Bristol was captured in 1645, the Commissioners took one of the larger houses in the city and converted it into

22 Hume, op. cit., p. 529.
a hospital. But such establishments as these were only temporary, and throughout most of both civil war periods the London hospitals were the only places where there was permanent provision for the care of sick and wounded soldiers. The London hospitals were far from adequate, however, and Parliament created two special military hospitals, one at the Savoy, and the other at Ely House. Other hospitals were subsequently established in Ireland and Scotland.

At these institutions the nursing was done by women, and, whenever possible, the nurses were "chosen from the widows of soldiers so far as fit ones can be found." The Parliamentarians also made provision for some support outside the hospitals for disabled soldiers and for the widows and orphans of soldiers. However, as the financial difficulties of the government increased, less and less was done for these unfortunate people. In March, 1660, it was reported that the revenues assigned to the hospitals had not been paid for nearly a year. This naturally caused distress among the inmates, distress so great that the following statement was made:

... Some have been starved; others have attempted to destroy themselves; and many are daily likely to perish through imprisonment, hunger, cold and nakedness. And the sick and maimed soldiers now under care in the said hospital are also ready to perish from want, not being able to stir out of their beds, and having no pay these four weeks.25

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25 "The Army Surgeon in Cromwell's Time," _ibid._
The Restoration ended all of these arrangements. The remaining soldiers in the hospitals were discharged; the widows and orphans were cut off from receipt of further pensions; and Parliament revived the Elizabethan statute which placed on the authorities of the individual counties the burden of aiding the poor.26

The beginning of the sixteenth century marks the real beginning of maritime medicine, bringing with it its own peculiar problems. Throughout the sixteenth and seventeenth centuries the principal disease encountered on board ship was scurvy. Scurvy, it must be pointed out, is one disease which is almost purely nautical. Although it did, and does, occur on land, the incidence is slight; and during the sixteenth and seventeenth centuries it was confined, with very rare exceptions, to seafarers.

Very little was done to combat the debilitating effects of this disease, although it was early recognized that scurvy was associated with the lack of fresh vegetables and fruit in the diet.27 In 1593 Sir John Hawkins had successfully used lemon juice as a preventive for the disease, but it was not until 1796 that its use received the official approval of

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27 The lack of refrigeration, of course, played a part in the lack of provision of the necessary lemons or fresh vegetables for the crews. There was no way to keep fresh provisions on a long voyage.
the Royal Navy. But it was not in fresh fruits and vegetables alone that the sailor's diet was deficient. It consisted in large part of bread or biscuit, beer, pork, oatmeal, butter, and cheese, and even these items were seldom of acceptable quality. More often than not, because of graft and corruption in the administration, the provisions which arrived on board ship were of such poor quality that they were unfit to eat. It is not surprising that scurvy killed many men in the service of the navy. There are no accurate statistics by which to calculate the damage it caused, but some idea of the mortality rate of the disease may be obtained from the statement of Sir John Hawkins that, within his knowledge, 20,000 men in the British Navy had succumbed to effects of scurvy.

Scurvy was not the only evil connected with service in the navy. Throughout this period impressment was used to man the ships. In times of war the press-gangs had authority to seize anyone for service. When this method did not produce enough sailors, the local jails were opened and the


inmates taken to do duty on board ship. The crews were collected and placed on board ship or confined in guardships where "they were kept under such circumstances of bad air and bodily filth as tend to generate the most virulent infections."31 Seamen had their quarters below deck. Here, crowded together like cattle, and cut off from fresh air, they spent what time they were not on duty. Disease was inevitable in this type of situation, and the seamen not only fell prey to all the infectious fevers, but they also contracted the usual maladies which result from exposure and fatigue. Thus they were "in general shortlived and have their constitutions worn out ten years before the rest of the laborious part of mankind."32

The high incidence of illness among the sailors was a matter of great concern to the British Navy, for a fleet which was decimated by disease was an impotent instrument. But little was done throughout this period to provide better care for those on board ship. This was not merely negligence. Very little could be done so long as the distinctions between the various diseases remained obscure, and so long as there were only vague ideas concerning the etiology of such maladies as typhus fever, typhoid, yellow fever, and other febrile ailments. Not until the various branches of medical

31Rosen, op. cit., p. 752.
32Roddis, op. cit., p. 235.
science had progressed much further than they had in the sixteenth and seventeenth centuries were the seamen, the soldiers, and the civilian population properly protected against infectious diseases.
CHAPTER V

PUBLIC HEALTH

Throughout the sixteenth and seventeenth centuries there was much epidemic disease. Bubonic plague, the "Sweating Sickness," measles, smallpox, tuberculosis, typhus, and dysentery took a heavy toll, and syphilis was a deadly affliction.\(^1\) In fact there is every reason to believe that wigs and court plaster, which were fashionable during this period, owed their vogue to epidemics of syphilis that wrought much havoc in court circles. The baldness resulting from this disease necessitated the use of wigs; and the facial blemishes, which were also a corollary feature, led to the invention of court plaster, which was first used at court, as its name implies.\(^2\)

The epidemics which occurred during these two centuries were undoubtedly related to the increasing movement of people within the country as well as to immigration from abroad. Expanding domestic and foreign trade, the enclosure movement and its attendant evictions, overseas contacts, with the

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consequent advent of new diseases which aggravated the already existing difficulties—all of these weakened the resistance of the people to epidemic disease.

During the reign of Henry VIII the government finally recognized the importance of sanitation and its relation to disease. In 1532 Parliament enacted legislation which provided for the institution of the Commission of Sewers in all parts of the kingdom. Though the work of the Commission was principally directed toward reclaiming land from the constantly encroaching sea, and toward the prevention of the flooding of lowlands by the rivers, the Commissioners also made regulations against the deposit of rubbish in rivers and the pollution of wells, streams, and rivers. Also, the larger towns were provided with regular water systems and public standpipes. London had been well supplied with water, but under the Tudors more conduits were set up, and fresh water was hawked about the streets in barrels. It is probable that these improvements owed much to the influence of Sir Thomas More, who was appointed one of the Commissioners of Sewers along Thomas Bank in 1514, and who, as Lord Chancellor, probably initiated the Act of Parliament which appointed Commissioners of Sewers in all parts of the kingdom.

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Mention must also be made of the effect of the Elizabethan Poor Law of 1601, an important landmark in the histories of both social welfare and public medicine. This law laid down the important principle that each parish or town was responsible for the care of its own poor, and that relief for these indigent persons was to be provided out of tax funds. It set up a plan for three types of institutions: an infirmary for the "impotent," including the sick; a workhouse for the able-bodied poor who wanted to work; and a correction house for the able-bodied persons who were unwilling to work. The Poor Law of 1601 was to be the basis for public relief in England and America for the next three centuries. However, while the law proposed the setting up of three different types of institutions, in actual practice each town usually had only one institution, the workhouse, or almshouse, in which the poor, both sick and well, were mixed indiscriminately. Gradually, communities adopted the system of hiring municipal physicians to take care of the sick in their own homes. Public provision for the insane, on the other hand, was motivated by the desire of the community to protect itself from potentially dangerous persons rather than by any regard for the needs of the patients. Those who were thought to be mentally unbalanced were confined in almshouses, in jails, or in "strong rooms" at home, and little or no effort was made to provide medical care for
Several centuries were to elapse before an enlightened attitude toward mental disease motivated public policies on the subject.

Any discussion of the public health measures in Tudor England must mention Sir John Harrington and his *The Metamorphosis of Ajax*. Harrington, a godson of Queen Elizabeth, translated into English certain passages of Ariosto's *Orlando Furioso* and circulated them among the ladies-in-waiting to the Queen. The ladies immediately professed their shocked modesty, and Sir John was banished to his home in Bath. Here he was ordered to stay until he had translated the whole of the book into acceptable English. While in this involuntary exile, he invented and installed a water closet and published the account of his invention in a book entitled *A New Discourse on a Stale Subject, Called the Metamorphosis of Ajax*—a pun on the word "jacks," which was the slang term for privy. This work once again involved the author in difficulties, not this time because of the subject of the book, but because of a suspected innuendo against the second Earl of Leicester.7

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The threat of a Star Chamber prosecution was warded off only when the Queen herself intervened on behalf of her godson.\(^8\)

This controversial book is a milestone in the progress of sanitation. Unfortunately the idea was premature, for it was not until well into the nineteenth century that towns and cities extended sewer lines to the houses.\(^9\)

Epidemic disease raged throughout England despite certain early measures taken to safeguard the public health. In 1566 it was stated that "the pore citizens of London were this yere plagued with a treble plague ... pestilence, scarcitie of money and derth of victuals."\(^10\) In 1577 the epidemics continued, and in that year some prisoners who had been brought to trial at Oxford infected the judges, with the result that many of the jurists died, including Robert Bell, the Lord Chief Baron. This trial came to be designated the Black Assize, and thereafter the custom arose of placing fragrant flowers in front of the judge who conducted a criminal assize.\(^11\)

The Sweating Sickness, or the "Sweate," as it was called, reached epidemic proportions each time it struck. It was one


\(^9\)Haggard, \textit{op. cit.}, p. 18.

\(^10\)Herman Pomeranz, "Medicine in Shakespearean Plays," \textit{Medical Life}, XLI (October, 1934), 531.

\(^11\)\textit{Ibid.}
of those mysterious maladies which suddenly makes its appearance, wreaks havoc and destruction for awhile, and then as suddenly disappears. This disease occurred only in England, where there were five epidemic outbreaks of it during the sixteenth century. In August, 1485, shortly before the Battle of Bosworth Field, it broke out for the first time among the troops and was given the name "Sweating Sickness" from its most important symptom. According to Hecker,

The people were seized with consternation when they saw that scarcely one in a hundred escaped, and their first impression was that a reign commencing with such horrors would doubtless prove most inauspicious.12

In 1502 it occurred in the West Country, and Prince Arthur probably succumbed to it at Ludlow. In 1507 a milder epidemic occurred, although it is reported that everywhere in London "there die not a few." And it was terrifying enough to cause public prayers to be held in August of 1508.13 The year 1517 witnessed a third and much more severe outbreak, half the population of a town perishing in some instances. During this period Wolsey was attacked by the disease, Colet succumbed to it, and Ammonio, the Latin secretary of the king, who had just been congratulating himself on being safe from the disease because of his temperate life, died after an


13August Hirsch, Handbook of Geographical and Historical Pathology, I, 243.
illness of only twenty hours. The fourth epidemic, in 1528, was one of great severity. In London that summer the mortality was very great. So severe was this epidemic that it was asserted that "the priests have a better time than the doctors, except that the latter do not help to bury," and that, although the year was one of scarcity, "if this thing goes on, corn will soon be cheap." Anne Boleyn was attacked by the disease during this epidemic, and Henry VIII, who always was fearful for his health, hastily left her for several weeks.

The fifth, and final, epidemic occurred in 1551. Oddly enough, it did not cause many fatalities among the poor, but chiefly affected the rich. John Caius, in his treatise, A Boke or Counseill Against the Disease Called the Sweate, noted that those who had the disease "were either men of wealth, ease or welfare, or of the poorer sort such as idle persons, good ale drinkers, and tavern haun ters."

The symptoms of the sweating sickness were such as to terrify the people. Du Bellay, the French Ambassador wrote:

One has a little pain . . . in the head and heart. Suddenly a sweat breaks out, and a physician is useless, for whether you wrap yourself up much or little in four

\[14\] Ibid., pp. 247-248.  \[15\] Ibid., p. 251.

\[16\] Ibid.


\[18\] John Caius, A Boke or Counseill Against the Disease Called the Sweate, p. 20.
hours, sometimes in two or three, you are dispatched without languishing.19

Doctor Thomas Forrester described the suddenness of death from the disease as follows: "We saw two prestys standing togeder and speaking togeder, and we saw both of them die suddenly."20 John Caius, however, most vividly described the speed with which the disease was fatal when he stated:

But that immediately killed some in opening their windowes, some in plaieng with children in their strete dores, some in one hour, many in two it destroyed, & at the longest, to them that merily dined, it gave a sorrowful Supper. As it founde them so it toke them, some in sleape, some in wake, some in mirth, some in care, some fasting & some ful, some busy and some idle, and in one house sometyme three sometyme five, sometyme seven sometyme eyght, sometyme more sometyme all. . . .21

The "English Sweat," with its five outbreaks within the period from 1485 to 1551, forms a completed episode in the history of pestilence. In 1551 it disappeared from the earth just as suddenly as it had appeared in 1485 as a malady quite unknown to the physicians or the public. Not until two hundred years later, when miliary fever appeared in Germany and France, does one find a disease even similar to the Sweating Sickness.22


21Caius, op. cit., p. 9.

22Hirsch, op. cit., p. 86.
Numerous attempts have been made to explain the etiology of this disease. It has been noted that all of the epidemics occurred after heavy rains. The disease always appeared in the spring or summer, and on no occasion did it remain longer than through the summer months.\textsuperscript{23} It has also been firmly established that, unlike the plague, the Sweating Sickness mainly affected the upper classes, which makes untenable one theory connecting the disease with poor sanitation. It has been thought, therefore, that it had a foreign origin, and suspicion has been thrown on the foreign mercenaries who accompanied Henry Tudor to England. These soldiers came from a district in France in which the sweat, in a much modified form, made an appearance some two hundred years later.\textsuperscript{24} But whatever may have been the exciting cause of the disease, it has become extinct. Today the most that can be done is to speculate about its cause.

Plague had remained endemic in England since 1349, the year of the Black Death, which, it has been estimated, destroyed two million persons. In contrast to the Sweating Sickness, the plague was the poor man's disease, and it well illustrated the usual rule of infectious diseases, attacking those who were the most ill-housed, ill-fed, and least able to escape from the locale of the infection.\textsuperscript{25} At the start

\textsuperscript{23}Ibid., p. 85. \textsuperscript{24}Ibid., pp. 268-273. \textsuperscript{25}Ibid., p. 269.
of the sixteenth century there was a general increase in the amount of plague in England, and it continued to strike again and again until 1665.

At this time the etiology of the disease was not even vaguely understood. It was attributed to miasma, or corrupt vapors, which entered the skin through the open pores. For this reason bathing was considered dangerous, since it causes the pores to open even wider. Some subscribed to the idea of contagion as the cause, but there was no real understanding of the source of that contagion. The only really effective preventive "was administered as three adverbial pills, quick, far, and late. That is, go quick, go far, and return late." This advice was followed by all who could afford it, with the king and the court setting the example.

The physicians, some of them at least, could not protect themselves in this way. They remained in the centers of infection, and often for protection they wore leather suits and leather gauntlets, masks with glass openings for the eyes, and long snouts filled with fumigants. They carried wands to feel the pulse of the victims so that they would not have to touch them, and, in order to purify the air, they burned aromatic substances and sprinkled perfumed water in the rooms and on their clothing.

26 H. W. Haggard, Devils, Drugs and Doctors, pp. 210-211.
Certain public health measures were taken in dealing with the disease. Henry VIII appointed Sir Thomas More, in April, 1518, to supervise the health measures to be taken at Oxford during an outbreak of the plague. More ordered all inhabitants who were infected with the disease to keep to their houses and to "put out wisps [of hay] and bear white rods." He forbade them to keep animals in their houses and ordered officers to keep the streets of the town clean, and to burn refuse.

Here one sees notification and segregation used for the prevention of epidemic disease. It was due to More's excellent sanitary regulations that a more widespread infection was prevented. The first general plague order was issued in 1543; it contained all the principles of subsequent preventive medicine. More had already been dead for eight years, but the order codified his previous regulations and instructions, and these were later adopted in the Elizabethan regulations. Instead of wisps of hay, the sign of the cross was ordered placed for five days on every house which was, or was suspected of being, afflicted by the plague. Segregation, disinfection—chiefly by burning straw pallets and by scouring—and the bearing of white rods by plague contacts were enforced. More stringent measures than these were employed


28 Ibid.
occasionally. For example, Elizabeth ordered a gibbet set up at Windsor with which to hang anyone who was a plague carrier, or one who had given shelter to a plague victim, or one suspected of having the disease. Charles I followed the same procedure at Woodstock.29

No year from 1511 to 1521 was free from an outbreak of the plague. The year 1513 was apparently that in which the highest mortality occurred, but in 1517 the disease was sufficiently widespread to motivate the Venetian envoy to beg the authorities at home to send someone to replace him, since he wished to escape from the "sedition, sweat and plague."30 Following this period there was a brief respite, only to be followed by constant outbreaks from 1526 to 1532. It was during this period, in 1532, that "the Council have commanded the mayor to certify how many have died of the plague."31 This is the first known reference to the London Bills of Mortality. After this time, the disease remained fairly dormant until 1563, when another outbreak became so severe that curates were directed to warn the inmates of houses where the plague had occurred not to come to church for a certain period thereafter.32 The epidemic of that summer and fall was


31Ibid., p. 294. 32Ibid., p. 317.
one of the most severe in the history of the city. Plague also struck with great severity in 1568, 1570, and 1574. In 1581 there was again great mortality from the disease. Elizabeth's government tried vigorously to prevent its spread. The various plague orders were scrupulously carried out, but the disease continued to increase. The only matter not covered by the sanitary provisions, and probably the thing which materially affected the spread of the infection, was the manner of disposing of the dead. Most of the people were buried in just a sheet, not in a coffin, and were placed in very shallow graves.

The epidemics of plague during the sixteenth century culminated in the outbreak of 1593, and the severity of this outbreak was responsible for an enumeration of the current public health practices in regard to the disease. These were:

First to command that no stinking doonghills be suffered neere the Cittie.

Every evening and morning in the hot weather to cause colde water to be cast in the streets, especially where the infection is, and every day to cause the streets to be kept cleane and sweete, and clensed from all filthie things which lye in the same.

And whereas the infection is entered, there to cause fires to be made in the streetes every morning and evening, and if some frankincense, pitch or some other sweet thing be burnt therein it will be the better.

Suffer not any dogs, cattes, or pigs to run about the streets, for they are very dangerous, and apt to carry the infection from place to place.

Command that the excrements and filthy things which are voided from the infected places be not cast into the streets, or rivers which are daily in use to make drink or dress meat.

That no Chirurgions, or barbers, which use to let blood, do cast the same into the streets or rivers.
That no vautes or previes be then emptied, for it is a most dangerous thing.
That all Inholders do every day make clean their stables, and cause the doong and filth therein to be carried away out of the Cittie; for, by suffering it in their houses, as some do use to do, a whole week or fortnight, it doth so putrifie that when it is removed, there is such a stinking savour and unwholesome smell, as is able to infect the whole street where it is.
To command that no hemp or flax be kept in water neere the Cittie or towne, for that will cause a very dangerous and infectious savour.
To have a specially care that good and wholesome victuals and corn be solde in the markets, and so to provide that no want thereof be in the Cittie, and for such as have not wherewithall to buy necessary food, that there to extend their charitable and goodly devotion; for there is nothing that will more increase the plague than want and scarcity of necessary food.
To command that all those which do visit and attend the sick, as also all those which have the sickness on them, and do walk abroad; that they do carry something in their hands; thereby to be known from other people.
Lastly, if the infection be in but few places there to keep all the people in their houses, all necessaries to cause all the clothes, bedding, and other such things as were used about the sick to be burned, although at the charge of the rest of the inhabitants you buy them all new.33

At no time in any of these orders was the rat even mentioned!

Throughout the seventeenth century, the plague continued to cause the greatest consternation in England. The epidemics which had occurred in the sixteenth century had been severe, but the seventeenth century witnessed the most severe outbreaks in English history, with the exception of the Black Death of 1349. A severe epidemic occurred in 1603. Another took place in 1625, and 1665 is known as the year of the "Great Plague," or the "Poore's Plague." In the intervening

33 Ibid., pp. 355-356.
years between these epidemics, the disease was present and severe in one locality or another and often attained semiepidemic proportions.

The reasons for the persistently high mortality from the disease were much the same as those mentioned earlier. In the first place, it became more and more difficult to maintain even minimum standards of cleanliness and sanitation. This was due, probably, to the steady increase of population in the cities. In the second place, there was a greater migration of people within the country, because of increased trade and the enclosure movement, both of which augmented vagabondage and reduced the health of the rural classes. In the third place, far more contact, both commercial and military, existed with countries overseas. In the fourth place, as far as the years 1603 and 1625 were concerned, the coronation ceremonies, in spite of precautions, may easily have contributed to the intensity of the epidemics.34

The epidemic of 1603, which cast a pall over the gaiety of the coronation of James I, claimed a large number of lives. The coronation attracted many visitors to London who wished either to see the festivities or to seek favors, and this influx helped to increase the spread of the plague. Steps were, of course, taken to prevent the dissemination of the disease.

Many people believed that trade with the Low Countries was the factor precipitating the outbreak. Accordingly, the Privy Council, in 1602, upon receiving word that the plague had broken out in Amsterdam and was driving many of the inhabitants of that city to England, ordered the commander of the Cinque Ports to prevent the landing of these emigrants while the plague persisted. The Council further ordered that if any persons had come into the towns, they must go into the fields of the country "the better to air themselves," and remain there forty days.35

Various other orders were issued. In April, 1603, the King's, Queen's, and Prince's Players were allowed to perform only when there were less than thirty deaths a week from the plague. The government forbade gentlemen to attend court, and during August and September the Lord Mayor limited the number of persons who could attend a plague burial to six. Court-terms were adjourned, public assemblies were discouraged, and fairs within fifty miles of London were prohibited.

London society was profoundly affected. Not just ordinary citizens, but even those whose presence was essential, left the city. Most of the physicians also left in haste; in fact it is stated that they "hid their synodical heads."36 Ministers fled in great numbers, as did the magistrates.

36Andrews, op. cit., p. 132.
The defection of the latter was serious indeed, for lawlessness went unpunished. The people paid scant attention to the deputies and constables who took their places.

Trade was greatly hampered by the prevalence of the disease. The revival of trade which had been anticipated in the wake of the coronation did not materialize. Instead the epidemic cheated the tradesmen of all their anticipated gains. French merchants generally agreed not to purchase broadcloth from England, a policy which brought bitter cries from the English. It is not surprising that the French adopted this policy, for many English merchants bought goods from infected persons, in violation of government proclamations, and merchant goods were packed by persons infected with the disease.

The epidemic greatly distressed such unfortunates as were obliged to remain in the infected places. People who were alive one hour were dead the next. Fear was rampant among the populace. Some committed suicide, others sought relief in taverns or in the churches; but the plague, no respecter of persons, continued to strike down both the unrepentant and the penitent. With the coming of cold weather, the epidemic gradually began to subside, and the court gradually began to return to London. There it met a new problem which was almost as dangerous as the plague, the lack of money. The social upheaval caused by the epidemic brought the government face to face with an empty treasury. Taxes, customs, and duties had brought in nothing. James was forced
to ask the City of London for a loan, which was refused, the City declaring that due to the stoppage of trade it was unable to comply with James's request.\textsuperscript{37} But London recovered from the epidemic with remarkable speed, and although the plague was never entirely absent from the city or its environs, there was nothing to strike terror at the hearts of the people until 1625.

Both the start and the end of the reign of James I were marked by a severe epidemic of bubonic plague. Just as it broke out in full force to welcome him to the throne in 1603, so it again made its fatal appearance in 1625 to mark his death. The coronation of Charles I was postponed until October and finally until February, 1626, not only because of Henrietta Marie's religion, but also because of the increasing incidence of the plague. However, the opening of Parliament kept many citizens in London despite their fear of the disease. Charles, in his opening speech to this assemblage, urged them to hasten their business because of the dangers from the continuing increase of the infection, but Parliament, which was far from eager to give Charles the money he wanted for the war against Spain, allowed financial considerations to override fear of the disease. It continued to sit from June 18 to July 11, adjourning then to resume its sessions at Oxford in August.\textsuperscript{38}

\textsuperscript{38}Ibid., pp. 135-136.
As the infection spread, the distress of the poor, together with the usual absence of law-enforcement officers at such times, produced a desperate situation. The following passage expresses the state of affairs:

An enemy swooping down upon the coast in these summer months would have made an easy conquest. The mustering of the train-bands in every county had been forbidden on 14 August. By the 31st the plague was amongst the seafaring men in the river, the pressing of sailors was discontinued, and the coast and the Thames were left unguarded. 39

London at this time was described as "one wide mortuary; a reeking prison house of the living, and dying and the dead." 40 Once again various orders were issued. The Lords of the Council were perturbed because they learned that no efforts had been made to prevent the disease "by carrying infected persons to the pest-house, or setting watch upon them, or burning the stuff of the deceased." 41 They insisted that these rules be obeyed. The Council also charged the Mayor and the Aldermen not to abandon the government of the city, and called a halt to all traffic coming into London. In spite of these measures, by August the infection had become so widespread that the remaining officials of the city abandoned all pretense of trying to maintain order. The deserted homes of the wealthy were ransacked, segregation

39 Ibid., p. 145.
41 Simon, op. cit., p. 96.
became impossible, and even life itself was so uncertain that the parting salutation became, not "Good Night," but "God send us a joyful Resurrection."\(^{42}\)

After August, as the weather became cooler, the epidemic began to subside, but in the year in which Charles I became king it is estimated that 1,313 people died of the plague.\(^{43}\)

The country, however, did not recover as rapidly from this epidemic as it had done in 1603. The disruption of commerce was much greater than it had been in 1603, for trade with foreign countries had practically ceased. A depression ensued, particularly in the cloth trade, and it spread rapidly to other areas of the national economy. Furthermore, a period of famine followed the plague year. These various misfortunes made the people totally unable to provide the forced loan or to furnish the ships which Charles demanded.

The plague of 1625 made a deep impression on the minds of Englishmen, and it was stated: "To this present Plague of Pestilence, all former Plagues were but pettie ones . . . This, to future Ages and Historiographers must needs be Kalendar the Great Plague."\(^{44}\) But unfortunately this estimate was false, since the various attempts to stop the disease were completely ineffectual. The plague reached its height in the great epidemic of 1665.

\(^{42}\)Wilson, \textit{op. cit.}, p. 146.\(^{43}\)Bell, \textit{op. cit.}, p. 7.

\(^{44}\)Wilson, \textit{op. cit.}, p. 175.
The rise in the death rate due to the plague usually began in the spring and continued throughout the period of hot weather. This was the pattern in 1665, when the disease was spreading rapidly in London before the middle of the year. By August and September, when the epidemic was at its height, there were six or seven thousand deaths a week. 45

The plague of 1665 has been a favorite theme of historical novels. The horrors described in them are not exaggerated. The citizens of London, who watched the weekly Bills of Mortality for any rise in the death rates which might indicate the reappearance of the plague, became more and more alarmed; and the general exodus to the country began. By July the city was finally emptying rapidly, especially of the wealthier persons fleeing for their lives. A devout Puritan element found that the greatest mortality seemed to occur among the poor and those of "vicious life." They immediately took comfort in this distribution of the disease and, it was said, "began to be puffed up and to boast of the difference that God did make." 46 They were soon to learn, however, that their self-righteousness was poor protection against the plague.

As the Bills of Mortality increased, panic spread. At the height of the epidemic, not one merchant in a hundred could be found in London. It was impossible to collect debts.

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45 Simon, op. cit., p. 100.  46 Bell, op. cit., p. 91.
or sell goods. Little sound was heard "save groaning, and crying, and dying." Traffic in the narrow streets was almost confined to the coffins which were constantly being carried back and forth as the dead were hurried to burial places. Many of the poorest people lay suffering in dark, unventilated cellars from which they did not emerge alive. The constant tolling of bells announcing death after death strained people's nerves to the breaking point. Each fresh event augmented the general dread. No night passed without the sound of the dead-cart as it noisily made its way over the cobbles, and the call of the bearers to "bring out your dead" rang in the streets. One early eighteenth century writer sums up the feelings of the people as follows:

The British Nation wept for the Miseries of her Metropolis. In some Houses Carcases lay waiting for Burial; and in others, Persons in their last Agonies; in one Room might be heard dying Groans, in another the Raveings of a Delirium, and not far off Relations and Friends bewailing both their Loss and the dismal Prospect of their own sudden Departure. . . .

Samuel Pepys stayed in London throughout the epidemic, and wrote in his diary the following impressions of the plague:

Aug. 8. The streets mighty empty all the way, now even in London, which is a sad sight. And to Westminster Hall, where talking, hearing very sad stories from Mrs. Mumford, among others, of Mrs. Mitchell's son's family. And poor Will, that used to sell us ale . . . his wife

47 Ibid., p. 231.
48 Medicina Flagellata; Or, The Doctor Scarify'd, p. 181.
and three children died, all, I think in a day... 49

Aug. 15. It was dark before I could get home, and so land at Churchyard stairs, where, to my great trouble, I met a dead corps of the plague... 50 I thank God I was not much disturbed at it. However, I shall beware of being late abroad again... 51

Aug. 16. To the exchange... 52 But Lord! how sad a sight it is to see the streets empty of people, and very few upon the 'change. Jealous of every door that one sees shut up, lest it should be the plague; and about us two shops in three, if not more, generally shut up... 53

Aug. 30. I went forth and walked towards Moorsfields to see (God forbid my presumption!) whether I could see any dead corps going to the grave; but as God would have it, did not. But Lord! how every body's looks, and discourse in the streets is of death, and nothing else, and few people going up and down, that the town is like a place distressed and forsaken... 54

The only note of levity in this discourse is struck when Pepys becomes perturbed over the fashions of the times:

September 3rd. (Lord's day). Up; and put on my coloured silk suit very fine, and my new periwigg, bought a good while since, but durst not wear, because the plague was in Westminster when I bought it; and it is a wonder what will be the fashion after the plague is done, as to periwiggs, for nobody will dare to buy any haire, for fear of the infection, that it had been cut off the heads of people dead of the plague... 55

John Evelyn gives his version of the dismal situation:

Sept. 7, 1665. I went all along the city and suburbs... 56 a dismal passage, and dangerous to see so many coffins exposed in the streets, now thin of people; the shops shut up, and all in mournful silence, not knowing whose turn might be next... 57

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50 Ibid., p. 178. 51 Ibid. 52 Ibid., p. 191.
53 Ibid., p. 191.
It has been estimated that the plague killed 69,000 persons in London alone. It is probable that the total was even higher, for many deaths probably went unreported. Although deaths were recorded weekly in the Bills of Mortality, they were reported not by physicians but by "hags" who, for a small fee, entered the houses where deaths had occurred and made a record of what they saw. Their testimony was unreliable, being often influenced by bribes. Pepys felt that the reported mortality was far from accurate:

... In the City died this week 9,496, and of them 6,102 of the plague. But it is feared that the true number of the dead this week is near 10,000; partly from the poor that cannot be taken notice of, through the greatness of the number, and partly from the Quakers and others that will not have any bell rung for them.

Probably the actual loss of life from the epidemic was 110,000 of the original population of 1,600,000, or of the 350,000 who did not leave London during the period.

The subsidence of the plague followed in the wake of the great fire of 1666. The fire, which raged for three days "as if it had commission to devour everything that was in its way," did for England what men had been unable to do: it destroyed the rats which carried the infection. The area

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55 F. H. Garrison, An Introduction to the History of Medicine, third edition, p. 308.
56 Pepys, op. cit., p. 192.
57 Geddes Smith, Plague on Us, p. 9.
58 Gilbert Burnet, An Abridgement of Bishop Burnet's History of His Own Times, by the Reverend Mr. Thomas Stackhouse, p. 80.
of destruction comprised 436 acres, mainly in the old section of the city. When London was rebuilt under the supervision of Christopher Wren, the narrow, dirty streets and tumble-down houses, perfect breeding places for the disease, disappeared. Other factors besides the fire contributed to the disappearance of the plague from England at this time. These included greater personal cleanliness through the use of cotton instead of wool clothing, improved street paving, decreasing use of straw for floor covering and bedding, and, finally, the increased use of brick instead of wood for building material. The victory of the brown rat over the black was also significant. The brown rat had been brought to England during the latter half of the seventeenth century, and had immediately pre-empted the black rats' food supply. The black rats were driven to the ships, carrying disease and death to sailors for many years to come. The brown rats did not seek close contact with human beings, and promptly migrated to the open countryside, where there was little opportunity for transmission of fleas from rat to human.59 The plague did not regain a footing on British soil for 243 years, when it was again introduced and spread widely throughout the land.60


60 Major Greenwood, Epidemics and Crowd Diseases, p. 291.
The consequences of this last great outbreak in 1665 are, in some respects, as far-reaching as those which followed the Black Death of 1349. In July, 1665, King Charles and his court left London for Isleworth. Such an act was favored by the populace, as the King's safety was of the highest importance to the country. The illness or death of Charles would have considerably aggravated the already troubled situation, since the heir to the throne, Charles's brother James, was greatly distrusted by the people. But the fate of the other officials of Charles's government was far from a primary concern, and no possible excuse can be given for the abandonment of London by officials whose first obligation was to the welfare of that city. Yet, abandon it they did, with a cynical indifference that "must forever remain a black stain on Charles's Government." 61 George Monck, Duke of Albemarle, remained in the city as the only representative of the King.

In general, the behavior of the clergy was as cowardly and irresponsible as that of the government authorities. Only a few courageous and self-sacrificing ministers remained in London. At such a time when no individual's life was safe for even a day, the people turned eagerly to religion. They had "a more than ordinary disposition to profit by good sermons," 62 but they were deprived of even this traditional comfort.

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61 Bell, op. cit., p. 68.  
62 Burnet, op. cit., p. 79.
Popular feeling rose at the flight of the government and the clergy. Services at St. Paul's were interrupted by an outcry declaring that the calamity which had befallen them had been caused by the government in Church and State. Leaflets were distributed which sarcastically declared, "Pulpits to let!" As the plague grew in virulence, Nonconforming ministers who had been ejected from their pulpits found the courage to resume their duties. These divines entered the vacant churches to preach to the throngs, and even dared to visit the sick in their homes.

The Great Plague had the important sequel upon the future course of English life and thought of establishing Nonconformity in England. Until 1665 the Nonconformist ministers had been forced to work in seclusion among very small groups of people. They were persecuted and prevented from preaching openly. But they proved their courage and their devotion to the people by risking their lives to comfort the afflicted and deserted people of London. Their actions made a deep impression upon the populace; and thereafter, despite guards, soldiers, or the jailing of whole congregations, Nonconformity in England could not be restrained.63

Though it is the plague which has occupied the attentions of most historians, other infectious diseases existed

63 Bell, op. cit., pp. 227-228.
in Tudor and Stuart times. Epidemics of smallpox, influenza, dysentery, typhoid, and typhus claimed many victims.

There is evidence that smallpox was present in England as early as 1514 and 1518, but as a virulent malady with a high mortality rate, it was relatively new to the country during the last part of Elizabeth's reign and the first years of the Stuarts. The first severe epidemic occurred in 1628, assumed more serious proportions during the reign of Charles I, and grew even worse as the century progressed. Many members of the royal family were attacked by smallpox. At least two of the children of Queen Anne died of the disease, and Anne herself was badly pockmarked. Queen Mary II died of smallpox in 1694, at a time when there were more than five hundred cases a week in London. This high rate of mortality in the royal family created considerable excitement and concern in medical circles. Disagreements developed as to the nature, diagnosis, and treatment of the disease. Erroneous treatment was considered to be the cause of the

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64 Creighton, op. cit., p. 456.
65 H. W. Haggard, *Devils, Drugs and Doctors*, p. 221.
67 Ibid., p. 106.
68 H. W. Haggard, *Devils, Drugs and Doctors*, p. 221.
69 Evelyn, op. cit., p. 505.
increased mortality, and, from the period of the Restoration on, the medical profession in England constantly endeavored to enlarge its knowledge and improve its methods in the treatment of the disease. Little progress was made, however, for we find that in 1672 one of the recommended treatments was
"the hiring of nurses, fat ones for preference, to lie by the patients' side and keep them warm."70

Typhus fever was another fatal affliction. Since the disease was common in the army, on board ship, and in jails, it was variously referred to as camp fever, ship fever, and gaol fever. Sporadic outbreaks of the disease occurred during the sixteenth and seventeenth centuries. Frequently it happened that at the assizes the justices were infected by the prisoners who were brought before them. At the "Oxford Black Assizes" in 1577, about three hundred persons who had attended fell ill and died in a period of twelve days. There was no general recognition that this was an outbreak of typhus. The belief was that the affliction was due to the "fetid and pestilent air of thieves brought forth from the prisons," or to some "devilishly contrived and obviously papistical spirits called forth . . . and let loose upon the court secretly and most wickedly."71

70 Stearns, op. cit., p. 106.

71 Creighton, op. cit., p. 377.
The worst epidemics of typhus occurred, however, in the eighteenth century, as a result of the window tax. This tax was first levied in England in 1696, and, in effect, it was a tax on fresh air and sunshine. It was levied for the purpose of overcoming the evils connected with the practice of clipping and defacing the coinage. During the seventeenth century all English coins were made by hand. They were not even in thickness or in size, and their edges were not milled. It was easy to clip such coins without danger of detection, and the practice of clipping coins quite naturally became widespread, especially in hard times. The result of this practice was a great shrinkage in the English coinage, which forced the government to recall all of the old coins and issue milled coins made by a minting machine. But the shrinkage in the amount of metal made a new tax necessary. Thus all inhabited houses were assessed two shillings a year, and an added tax was levied on windows. As a consequence, windows were bricked in and skylights were roofed over. The poor were affected most of all. Those who lived in the tenements were crowded together in dark rooms, and in the jails the prisoners were herded together in damp, unlighted cells. Typhus is a disease which breeds in such circumstances; it began to spread through the tenements and jails. But it did not stop there. Released prisoners who were impressed into
the navy carried the disease with them, and it rapidly spread on board the ships.72

Typhoid fever also claimed many victims during these two centuries. It was a disease which was poorly understood; in fact it was undescribed before this time. Thus when Henry, Prince of Wales, was afflicted, it was immediately said that he had been poisoned. Rochester, afterward Earl of Somerset, was at once suspected, and there were hints that even James had a part in the plot. It was natural that suspicion should fall on Rochester, for it was common knowledge that both he and Henry were rivals for the attentions of Lady Essex.

According to the custom of the time, various remedies were sent to the Prince from most of the distinguished people of the country. Even Sir Walter Raleigh, who was imprisoned in the Tower at this time, sent his famous 'fever cordial' to the young Prince. Raleigh said explicitly in his letter which accompanied the cordial that it would certainly cure Henry unless he had been poisoned. So great was the public belief in the power of the cordial that, when Henry died, it seemed certain that he had been the victim of a murderous conspiracy.73

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73 R. L. MacDonnell, "The Stuart Period From a Medical Standpoint," Canada Medical and Surgical Journal, XI (May, 1883), 587-588.
Syphilis, too, spread insidiously throughout the country. It was called by various names, such as the French pox, the Spanish pox, the great pox, and the grandgore, but there are few references to it in the writings of the early Tudors, none of which was written by members of the medical profession. The professional silence was finally broken in 1576 when William Clowes discussed methods of treating the disease. His treatise was exceptional, however; the main interest in syphilis during this period was political rather than medical. It was widely believed and asserted by enemies of the Catholic Church that the priests were guilty of "scandalous conduct" and responsible for "its attendant disease." The term "pocky priest" became a commonplace. Simon Fish, in his A Supplication for the Beggars, was one of the many to voice this sentiment:

These be they that haue made a hundreth thousand ydell hores yn your realme whiche wolde haue gotten theyre tyuing honestly, yn the swete of theyre faces had not theyre superfluous rychesse illected theyme to vnclene lust and ydelenesse. These be they that corrupt the hole generation of mankind yn your realme, that catche the pokkes of one woman, and bere theym to an other. . . .

This association of syphilis and Catholicism is evident, too, in the attack upon Cardinal Wolsey. The sixth charge against him states:

74Creighton, op. cit., p. 415.
75Simon Fish, A Supplication for the Beggars, edited by Edward Arber, p. 7.
The same Lord Cardinall, knowing himself to have the foul and contagious disease of the great pox, broken out upon him in divers places of his body, came daily to your Grace . . . blowing upon your most noble Grace with his perilous and infective breath, to the marvellous danger of your Highness, if God in his infinite goodness had not better provided for your Highness. And when he was once healed of them, he made your Grace believe that his disease was an impostume in his head, and of none other thing.\textsuperscript{76}

After the introduction of drugs from the New World, syphilis became somewhat less serious. This is not to say that it was in any degree prevented; for during the Restoration period when there was a general relaxing in the moral standards which had been enforced by the Puritans, there was a high incidence of the disease. But it was made less dangerous by new methods of treatment.

Throughout this period it was difficult indeed to raise the general level of public health. The causes of diseases were not understood, and superstitious rather than scientific explanations prevailed. Further advances could come only with better understanding of the principles of sanitation and of the infectious nature of epidemic disease.

\textsuperscript{76}Creighton, \textit{op. cit.}, p. 422.
CHAPTER VI

POPULAR MEDICINE

The treatment of sickness and disease in the sixteenth and seventeenth centuries was, like the cooking and preparing of food today, considered the proper business of any person interested in it. There was no notion among the masses that any special or formal training was required. Consequently, the remedies or cures prescribed were often harmful, for they were products of ignorance, superstition, and belief in magic. Doctors were not held in any higher esteem than quacks and were rarely called upon, at least by the masses. The popular view was that disease was something present in the body, and that it might be driven out by some remedy or other. In this respect there was faith in medicine, which was in no way equivalent to faith in physicians.¹

Medical education in this period remained, in spite of numerous scientific advances, largely a matter of didactic lecturing, based upon the authority of the classical texts and encumbered with astrological lore. Consequently, old folk remedies retained a great hold and quacks abounded.

The belief in the doctrine of signatures or similitudes, the feeling that God in providing remedies had, in many instances, indicated their virtues, that He had "imprinted upon the plants, herbs, and flowers, as it were in hieroglyphics, the very signatures of their virtues," continued, as in the past, to influence the selection of remedies employed in the treatment of disease. The usefulness of various substances, therefore, was indicated by their shape, color, or form. For example, red sandalwood and rose leaves were recommended for hematologic disorders, and saffron and rhubarb were prescribed for liver diseases. Lungs of foxes were used in treating pulmonary complaints, and the liver of wolves was administered for jaundice. Walnuts had the perfect signature of the head; therefore, "if the hernell be bruised and moistened with the quintessence of wine and laid upon the crown of the head it comforts the brain and head mightily." Metals were credited with great healing powers which always corresponded to the deities or planetary bodies with which they were associated: gold, which was ruled by the sun, was felt to be a restorative; and iron, associated with the planet Mars, was thought to possess the property of increasing physical strength.²

²C. H. LaWall, Four Thousand Years of Pharmacy, p. 320.
³Ibid., p. 321.
⁴C. J. S. Thompson, The Mystery and Art of the Apothecary, pp. 203-204.
Superstition was rife. Queen Elizabeth wore a blessed ring around her neck which had the "virtue of expelling infected air," and Thomas Linacre, in 1518, wrote to Guillaume Budé, the leading French humanist, that he was sending him some rings consecrated by the king against spasms. The belief in the "unicorn's horn" as an antidote for poison was prevalent until the reign of Charles II, when the Royal Society, by request, investigated the properties of this material and reported it to be useless. Another commonly accepted antidote for poison and snake bite was the bezoar stone, a concretion formed in the intestines of animals, usually goats. Perhaps the rarity of the "unicorn's horn" and the bezoar stone was the element that caused people to attribute magic powers to these things. Another unusual substance that was highly esteemed was "mummy," a compound described as follows:

... [It] has had the Honour to be worn in the Bosom next to the Heart, by the Kings and Princes ... 'twas presented with the greatest Assurance, that it was able to preserve from the most deadly Infections, and that the Heart was secured by it from all kinds of Malignity: They expected long Life from the decay's or dead, Spice, and Balsams, and Gums, and the Piece of the dead Body of an Egyptian Prince, or of a Slave preferred by him: If taken inwardly, it was avov'd to be

5H. W. Haggard, Devils, Drugs and Doctors, p. 297.

6Lynn Thorndike, A History of Magic and Experimental Science, V, 176.

7H. W. Haggard, The Lame, the Halt, and the Blind, p. 325.
able to dissolve the Blood coagulated, to give new Life and Motion to all the Spirits. 8

More commonplace substances were also believed to have medicinal virtues if they had unusual or gruesome associations. For example, there was usnea, a moss scraped from the skull of a criminal who had been hanged in chains. Its counterpart, which was used externally, was a piece of rope with which a man had been hanged. This rope was the property of the hangman, who cut it into as many pieces as possible and then auctioned off the bits to the highest bidders. 9

Astrology, during the sixteenth century, was as much a requisite for the practice of medicine as it had been in the Middle Ages. For example, Doctor John Halle, in 1565, gave this advice to the prospective young doctor:

Not only in chirugery
Thou oughtest to be experte;
But also in astronomye
Both preuye and aperte. 10

Thomas Vicary also endorsed the importance of astrological knowledge, and his theory of the moon's influence on the brain and mind was stated as follows:

... Also the brayne hath this propertie, that it moveth and followeth the moving of the Moone; for in the waxing of the Moone, the Brayne followeth upwardes; and in the wane of the Moone, the Brayne descendeth

8Medicina Flagellata: Or, The Doctor Scarify'd, p. 118.

9H. W. Haggard, The Lame, the Halt, and the Blind, pp. 327-328.

downwardes, and vanisheth in substaunce of vertue; for then the Brayne shrinkeith togethether in it selfe, and is not so fully obedient to the spirit of feeling. And this is proved in menne that be lunatike or madde, and also in men that be ... moste greeved in the beginning of the newe Moone, and in the latter quarter of the Moone ... 11

According to astrological medicine there were two types of diseases: acute and chronic. Acute diseases, as a rule, ended in eight days; but an illness that lasted thirteen days was adjudged to be chronic. All acute diseases were attributed to the influence of the moon, whereas all chronic disorders were attributed to the influence of the sun. The plague, on the other hand, was caused by the "conjunction of Mars, Jupiter, and Saturn in Aquarius." 12 Medico-astrological reasoning may be outlined as follows: a patient is taken ill when the moon is in Aries, is decreasing in light and in motion, and at the same time is afflicted by a conjunction, quartile, or opposition of Saturn; the disease, it may be assumed, has originated from a cold cause, for Saturn is cold and dry, and the moon is cold and moist; the illness is accompanied by a heaviness in the head, the humors of which have been "distellated" into the breast; the eyes will be weak and dull, the throat and windpipe will be stopped with phlegm, and the pulse will be "weak and inordinate"; the patient will be more affected at night than during the

11 Ibid., pp. 218-219.
day, and the internal organs will be quite hot, whereas the skin will be cold; a "loathing in the stomach, with swoonings, and inordinate Sweatings" will be symptoms, and the physician should prescribe medicines which will "heat and loosen" the stomach; bloodletting will be useless, and the patient will die if the moon does not apply to any of the fortunes; but if the moon does apply to the fortunes, either the patient will recover, or the disease will change into another disease.¹³

Further admonitions in the practice of astrological medicine consisted of such warnings as: "Administer no purgation when Leo ascends, lest it cause vomit," and "Purge the Lungs, when Jupiter is weak; the Gall, when Mars is weak . . . the Brain when the Moon is weak."¹⁴

In addition to the belief in supernatural causes and cures of disease, there was great belief in the curative properties of plant and animal substances. No one could neglect the study of botany, and the housewife, who included among her duties the compounding and prescribing of remedies, perused her herbal with great diligence. The herbal, a household book more necessary than a cookbook, combined accounts

¹³Camden, op. cit., pp. 221-225.

of plants with discussions concerning their cultivation and use.\textsuperscript{15} Rhubarb, senna, bitter apple, poppy, henbane, and poisonous yew were considered useful in treating various afflictions.\textsuperscript{16} Practically every herb that was cultivated or grew wild was used in preparing various compounds, which were, sometimes, quite as complicated as the following recipe:

Take two drachms of white perles; two little pieces of saphyre; jacinthe, corneline, emerauldes, granettes of each an ounce; setwel, the sweet root doronike, the kind of pomecitrion, mace, basil seed, of each two drachms; redee corall, amber, shaving of ivory, . . . two drachms; roots of both white and red cardamon, of each one drachm; troches of cinnamon, galinga, zurubeth, which is a kind of setwel, of each one and one-half drachms; thin pieces of gold and sylver, of each half a scruple; musk, half a drachm.

Make your electuary with honey emblici, which is the fourth kind of mirobalans, with roses, strained in equal parts, as much as will suffice.\textsuperscript{17}

This compound was thought to make one "bold-spirited, the body to smell well, and ingendereth to the face a good color."\textsuperscript{18} It was also guaranteed to heal "cold diseases of ye braine, harte, stomach," and to prevent "tremblynge of the harte, faynting and swooning, the weakness of the stomacke, pensiveness [and] solitarines."\textsuperscript{19}

\textsuperscript{15}L. B. Wright, \textit{Middle-Class Culture in Elizabethan England}, p. 574.


\textsuperscript{17}Herman Pomeranz, "Medicine in the Shakespearean Plays and Era," \textit{Medical Life}, XLI (October, 1934), 482.

\textsuperscript{18}La Wall, \textit{op. cit.}, p. 209.

\textsuperscript{19}Pomeranz, \textit{op. cit.}.\textsuperscript{19}
Other remedies ran the gamut of man's imagination. A
gargle for sore throat was compounded of barley water, vin-
eger, and syrup of mulberries,20 and a plaster for shingles
was "made of red wormes which doe come out of the earth."21
The prescription for the drugs used in the treatment of Sir
Upton, Queen Elizabeth's ambassador to the court of Henry IV,
consisted of "Confectio Alcarmas compounded of mink, amber,
gold, pearl, and unicorn's horn, with a pidgeon applied to
his side."22 For melancholy, Andrew Boorde advised eating
fat meats, "as goose, pig and to drinke good drinkes,"23 and
he also suggested that a person who is "gogill-eied," that is,
who squints, "beware what is put into the eye except it bee
cold unlesse it bee womans milk and the blood of a dove."24

The ever present menace of the plague brought forth nu-
merous suggestions for its treatment. A common practice was
the application of a fowl, plucked of its tail feathers, to
the carbuncles of plague patients.25 For protection against
the disease, people were advised to chew "the roote of An-
gelica, Setwel . . . or Sinamond,"26 or to "take Garlicks,

20 Davis, op. cit., p. 167.
21 W. G. A. Robertson, "The Brevairie of Helth by Andrew
Boorde," Annals of Medical History, VI (December, 1924), 474.
22 H. W. Haggard, Devils, Drugs and Doctors, p. 323.
23 Robertson, op. cit., p. 473. 24 Ibid., p. 474.
25 Davis, op. cit., p. 166.
26 Present Remedies Against the Plague, p. A.
peele it and mince it small, put it into new milke and eate it fasting."

The public was also advised that a good fumigant could be obtained by putting a red-hot new brick into a "Bason of Vinegar," from which "the fume thereof ascend into your houses." Even the onion was utilized as a disinfectant, evidently because strong odors were usually associated with purification. So the following method of fumigating was advised:

Take large onions, peele them, and lay three or foure of them upon the ground, let them lie ten daies, & those... onions will gather all the infection into them that is in one of those Roomes: but burie these onions afterward deepe in the ground. Thomas Basbridge implied that a return to religion was the proper treatment; for the plague, he said, was due to the "daily customes of running to playes, and enterludes, and to beare-baitinges, as well uppon the Sabboth day... as upon other days appointed for men to work."  

A sufferer from smallpox often received drastic treatment: he was placed in a meat-pickling vat and fumigated with cin-nabar, then given a severe sweating, and finally put on a low diet. Thomas Sydenham, however, used another treatment which one of his patients has described as follows:

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In the Beginning I lost Twenty-two Ounces of Blood. He gave me a Vomit... I went abroad, by his Direction, till I was blind, and then took to my Bed. I had no Fire allow's in my Room, my Windows were constantly open, my Bed-Clothes were order'd to be laid no higher than my Waist. He made me take twelve Bottles of Small-Beer, acidulated with Spirit of Vitriol, every Twenty-four Hours.

Although royalty had attending physicians, the sovereign and his court considered themselves to be as capable of devising treatments as the doctors were. Henry VIII, for example, tried his hand at compounding remedies. The majority of these were for external application and were probably used by the King in his later years when he became very stout and suffered from various afflictions of the legs. Thus one finds prescriptions for a "plaister to resolve humoures where there is a swellynge in the legges," "a plaister to resolve payne," and another "to ease payne and swellynge about the ancles."

Henry devised one remedy called "The King's Majestie's Own Plaster," which was supposed to resolve "humoures where there is swellynge in the legges." This compound was fully as complicated as any devised, as is clear from the recipe:

Take the rootes of marsh mallowes, washe and pike them cleane; then slytte them and take out the inner pythe and cast it awaye and take the other parte that is faire and white and cutt them in small peces and


bruysede them a lyttle in a mortar and take of them half a pounde and put them in a newe erthen panne. Then put thereto of linsede and herugrec of eche two unces, a little bruysed in a mortar, then take malvase and white wine of eche a pynte and styrrre all these together and let them stand till it wax thick and lyke a slyme, then take it from the fyre and strayne it through newe canvas. Then you have your muscellage rede to make the plaistar with. Then take of fyne oyle of roses a quarte, and washe it well with rose water and white wyne, then take the oyle cleane awaye from the wyne and the water, and sett it over the fyre in a brasse panne, alwayes styrring it, and put thereto the powder of lytherage of gold . . . and of silver, of eche of them viij unces, ceruse vj unces, redde corrall, ij unces, bole armeniac, sanguinis draconis of eche of them i unce, and in any wyse lett them be fyneely powdered and cersed. Then putt them into the oyle over the fyre, alwayes styrring, and lett not the fyre be to bigge for burnyng of the stuff. And when it begynmeth to wax thicke then put in vj unces of the said muscellage by a lyttle at once, or else it will boyle over the panne. When it has boyled ymough, which you shall perceave by the hardnes or softnesse thereof when you drope a lyttle of it on the bottome of a dyshe or sawcer, or on a colde stonne, then take it from the fyre, and when it is newe colde make it in rolles and wrappe them in parchement and kepe them for your use.34

Rules were also given for the preservation of health.

Thomas Elyot, the author of The Castel of Helth, stressed the importance of breakfast:

Choler beyng cruuent in the stomake sendeth up fumosities unto the brayne and causeth hed ach, and some-tyme becommeth adjust [burnt] and smoulderth in the stomake, whereby hapneth perillous sicknes and sometyme sodein deth. Therfor men and women not aged havynge their stomakes clen, let them in Goddes name breake their faste.35

Elyot also asserted that the position of the body during

34Ibid., pp. 170-171.

35Thomas Elyot, Castel of Helth, p. 41.
sleep affected the individual's health:

Thei that are hole must slepe first on the right side, because the meate may approache to the lyver, which is to the stomake, as fyre under the potte and by hym is digested. To them which have feeble digestion, it is goode to slepe prostrate on theire bealies, or have their bare hand on their stomakes. Lying upright on the back, is to be utterly abhorred.36

Cheyne gave this advice to certain classes of people:

... The Valetudinary, Sedentary, and Studiosous, ought carefully to avoid evening Deys, nocturnal Studies, and unseasonable Watching; go to Bed by eight, nine, or ten, and rise proportionally by four, five, or six; unless actually under a Fit of Sickness.37

Furthermore, he had this to say about the relation of clothing to health:

... Those who are sober, or who would render themselves hardy, ought to accustom themselves to as few cloaths, both in Summer and Winter, as is possible. ... much and heavy cloaths, attract and draw too much Perspiration and debilitate the Habit, and weaken the Strength.38

Among the remedies prescribed by physicians for various ailments were the teeth, claws, hoofs, and bones of many animals, snake-skins, scorpions, wood-lice, and bones of executed criminals.39 Although many treatments of dubious value were expurgated from the pharmacopoeia by Robert Boyle, innumerable loathsome remedies continued to be accepted. Boyle himself

36Ibid., p. 46.


38Ibid., p. 195.

39W. J. Meek, "Medicine in Shakespeare," Texas Reports in Biology and Medicine, X (Summer, 1952), 386.
regarded highly the therapeutic value of "the sole of an old shoe worn by some man who had walked much." This leather was ground up and taken internally for dysentery.\textsuperscript{40} Equally amazing remedies obtained the sanction of the medical faculty and were incorporated in the pharmacopoeias. A tincture of red coral was recommended as a "Killer of Worms";\textsuperscript{41} powdered crab eyes, dissolved in wine vinegar, was prescribed for "curing of old ulcers and fistula's";\textsuperscript{42} a combination of "rainwater eight times distill'd," "spirit of honey," and leadsalt was prescribed as a specific against "madness, melancholy, quartans, consump tions, and . . . obstructions of the Spleen";\textsuperscript{43} distilled viper's flesh, although admittedly "so fetid and stinking, that it is not to be us'd either outwardly or inwardly, except only in the Case of Hysterick Fits," was, when distilled with "Spirit of Mitre," felt to be "a moste excellent Medicine," good for the plague, malignant fevers, poison, epilepsy, apoplexy, palsy, and asthma.\textsuperscript{44}

One remedy for weak eyes was remarkable, to say the least. The patient cut off his hair and then gathered a quantity of woodlice; he took seven of these lice, washed them in

\textsuperscript{40}H. W. Haggard, \textit{The Lame, the Halt, and the Blind}, p. 327.

\textsuperscript{41}W. Salmon, \textit{Pharmacopoeia Bateana: Or, Bate's Dispensatory}, translated from the last edition of the Latin copy, p. 184.

\textsuperscript{42}\textit{Ibid.}, p. 204. \textsuperscript{43}\textit{Ibid.}, p. 209. \textsuperscript{44}\textit{Ibid.}, pp. 78-79.
water, and then pounded and strained them into a small draft of beer; he then dropped some of this into his eyes and drank the rest before breakfast. George Bartische, however, proposed another treatment. Believing that immorality was the main cause of all eye troubles, he warned his patients against eyeglasses and recommended amulets and prayers instead.

Painful ears, on the other hand, were treated with drops composed of "Oils of Scorpions . . . and Almonds."

Robert Hooke believed that the blood of a black cat would cure chilblains, and that an ounce of castile soap boiled in a pint of ale "till the ale was half consumed and drank warm was a sure medicine for the yellow jaundice."

The eating of the roasted liver of a mad dog was recommended as a cure for hydrophobia. A cure for palsy was smelling "at handkerchiefs which have lain for some days in the eggs of a horse-aunt's nest." It is certainly not surprising that the taking of medicine was unpopular.

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45J. R. Clemens, "Notes on English Medicine (Henry VIII - George IV)," Annals of Medical History, III (May, 1931), 310.
46Pomeranz, op. cit., p. 483.
47John Radcliffe, Pharmacopoeia Radcliffeanae, II, 527.
48H. W. Robinson, "Robert Hooke, M. D., F. R. S., With Special Reference to his Work in Medicine and Biology," Proceedings of the Royal Society of Medicine, XXXVIII (July, 1945), 486-487.
49Meade-King, op. cit.
Nevertheless, everyone believed that his favorite remedy would effect miraculous cures, and thus the treatment of disease sometimes became a complicated problem. An example of this is the confusion that developed during the final illness of James I. James died at the age of fifty-nine, from a form of Bright's disease, after a life that has been termed "one long disease." During his last illness there was much interference with the physicians because everyone had an infallible remedy to offer James. The Duke of Buckingham and his mother brought suspicion upon themselves by secretly applying a plaster to the King's wrists. The plaster was applied just as James started to have a convulsion, and when it was finally removed, the fit began to subside. Naturally the doctors were quick to claim that James's improvement was due to the removal of the plaster, and they refused to continue treating the King unless Buckingham promised to keep away from him. This promise was obtained; but after James's seventh convulsion, the Duke again became dissatisfied with the conduct of the case and secretly administered a julep to the King. After that, apparently, James became much weaker.

Buckingham's well-meant but injudicious actions affected his own fortune instead of the King's condition. Dr. George Eglisham, one of James's Scottish physicians, publicly charged the Duke with having poisoned James; and later, during the

51 H. W. Haggard, Devils, Drugs and Doctors, p. 335.
impeachment proceedings against Buckingham, the affair was not forgotten. The thirteenth accusation against him was "his transcendent presumption in giving physic to the king."\textsuperscript{52}

The treatment of Charles II during his last illness was complicated by the administration of medicines instead of interference with the physicians. On February 2, 1685, Charles was being shaved when he suddenly emitted a cry, fell backward, and had a convulsion. Bishop Burnet states that "his stomach was gone, his speech and memory failed him."\textsuperscript{53} Although he rallied once or twice after losing consciousness, he died within a few days. It is presumed now that Charles suffered from chronic nephritis and finally died of uremia.\textsuperscript{54}

The attending physicians tried everything. First, the King was bled; a pint of blood was taken from a vein in his right arm, and his shoulder was cut into and the incised area "cupped" to draw out more blood. Then an onslaught of drugging began. Emetics and purgatives were administered. Enemas consisting of antimony, sacre-bitters, rock-salt, violets, mallow-leaves, beet root, camomile flowers, fennel seed, aloes,

\textsuperscript{52}R. L. MacDonnell, "The Stuart Period From a Medical Standpoint," \textit{Canada Medical and Surgical Journal}, XI (May, 1883), 592-593.

\textsuperscript{53}Gilbert Burnet, \textit{An Abridgement of Bishop Burnet's History of His Own Times}, by the Reverend Mr. Thomas Stackhouse, p. 217.

linseed, cinnamon, cardamom seed, saphron, and cochineal were given. His head was shaved and a blister raised on his scalp; hellebore root powder was given to make him sneeze, and cow-slip powders were administered to strengthen his brain. Interspersed with the cathartics was a drink composed of barley water, licorice, and sweet almond. White wine, absinthe, and anise, as well as extracts of thistle leaves, mint, rice, and angelica were also administered. But the King’s condition became no better, and so more ingredients were added to the various remedial measures. Melon seeds, manna, slippery elm, black cherry water, extract of flowers of lime, lily-of-the-valley, peony, lavender, dissolved pearls, gentian root, nutmeg, quinine, and cloves found their place in the therapeutic armamentarium. As a final heroic measure, the King was given forty drops of extract of human skull, which was supposed to allay convulsions, a dose of Raleigh’s antidote, bezoar stone, pearl julep, and ammonia.55

The populace had great faith in the efficacy of the Royal Touch as a cure for the “King’s Evil”--a disease now identified as tuberculosis. This scrofula, which attacked the cervical glands, was treated by medical men with lotions, liniments, and ointments, by dietetic measures, and by change of air and surroundings. Popular opinion, however, favored

55 H. W. Haggard, Devils, Drugs and Doctors, pp. 334–335.
a cure by the Royal Touch, and thousands of people, seeking this remedy, travelled from remote parts of England to London.

The Royal Touch for the "King's Evil" was associated with the doctrine of the divine right of kings. In ancient times the personal power of healing was always an attribute of the gods. By a logical development, therefore, the healing power was extended to the representative of the gods, first to the holy man and later to the king. Just why both the English and French kings chose scrofula as the disease to be cured by the exercise of divine power is not known. It has been suggested that in its extreme form it bore a resemblance to leprosy, and leprosy had always been a disease set apart from all others as curable only by divine power.56

The piece of gold which was given to the people who received the Royal Touch added greatly to the popularity of this form of treatment. It was generally believed that if this "touchpiece," as it was called, were lost, the disease would recur.57 Originally a penny was given to each supplicant; later a gold coin called an "Angel" was given. The expense involved was, of course, very great, for in 1660 no less than 6005 persons were touched. Most people believed

56 H. W. Haggard, The Lame, the Halt, and the Blind, p. 251.

the cure to be miraculous, but the fact that each applicant for treatment was required to take an oath that he had not previously been touched suggests that monetary considerations also entered into the popularity of the rite.58

Charles II was the busiest of all the royal touchers, but it is noteworthy that more people are said to have died of tuberculosis during his reign than in any other period of English history.59

The Jacobites maintained that the power did not descend to William and Mary or to Queen Anne, although the ceremony was performed repeatedly by these rulers. William did not believe in the practice, however, and was known to say at the time of the ceremony, "God give you better health and more sense."60 Anne, who was superstitious, practiced the Royal Touch, and Samuel Johnson was a recipient of the favor at her hands when he was a child.61 The Hanoverian kings, however, never engaged in the practice, and during the reign of George I a special form of prayer designed for the occasion was removed from the Prayer Book.62 Superstitions,

59H. W. Haggard, The Lame, the Halt, and the Blind, p. 251.
60Power, op. cit., p. 129.
61In spite of receiving the Royal Touch Doctor Johnson suffered from scrofula throughout his life.
62Power, op. cit.
however, die hard, and within the last seventy years a pilgrimage was made from a distant part of England to Ashburnham in hope of a cure by touching a sheet in which the body of Charles I was wrapped after his execution. 63

It is also interesting to note that Valentine Gatrekakes, an Irishman who served with Cromwell, became, after a period of mild mental derangements, obsessed with the idea that God had given him the power of curing the "King's Evil." Since there was no king at that time to perform the function, Gatrekakes undertook to do it himself. Many men, even Robert Boyle, joined in praise of his work. But the cures proved only temporary, and Gatrekakes lost confidence in himself and gave up his work. 64

Other superstitions also prevailed. One of the most important was the belief in the Sympathetic Powder of Sir Kenelm Digby. During the Middle Ages a belief in weapon ointment flourished. The ointment was applied to the weapon which had caused the wound, whereas the injury was merely washed and bandaged. Digby's Sympathetic Powder was an outgrowth of this weapon ointment. It had an advantage over the ointment in that it was not applied to the weapon inflicting the wound, an object often difficult to obtain, but, instead, to the clothes which had been soiled with blood from the wound. The

63 Ibid.
64 H. W. Haggard, Devils, Drugs and Doctors, p. 295.
wound itself received no treatment except washing with water and bandaging with clean cloth. The powder was supposed to work in this manner:

The surgeon procureth a garter or bandage . . . wherewith the hurt was first bound up, and sprinkleth with the powder the blood upon the garter or bandage— and the patient thereupon feelith an intolerable shooting and penetrative torment; but this soon vaniseth, thenceforward all former evil symptoms depart.65

Digby's explanation of his Sympathetic Powder, which was composed of green vitriol, was this:

. . . The rays of the sun extracted from the blood and the vitriol associated with it, the spirit of each in minute atoms. These combined, and the air charged with the atoms of blood and vitriol were attracted to the wound and effected the cure.66

There was a widespread belief in this powder, which was investigated by James I, Prince Charles, and Buckingham; and Digby became famous in England. Gossip flourished about the man, however, for at different periods in his life he had been an admiral, a theologian, a critic, a metaphysician, a disciple of alchemy, and one interested in quasi-medical fads. John Evelyn, not mincing words, called him "an arrant mountebank."67 It was said by many that he killed his wife by

66 La Wall, op. cit., p. 325.
feeding her too much viper's flesh in an effort to improve her complexion.68

During this period England was overrun by quack practitioners. This development is not surprising. The regular medical practitioners were following, like will-of-the-wisps, one medical system after another rather than applying any of the principles of pathology that were then known. And, as has always been true of irregular medical practitioners, they had many influential clients. Consequently, there were many protests when the College of Physicians tried to end the practice of these quacks. The College was threatened by Robert Walsingham when it attempted to restrict the activities of Margaret Kenwix, a herbalist who was patronized by Queen Elizabeth, and of Not and Buck, two charlatans who were held in high esteem by Walsingham himself.69 The quacks included astrologers, fortunetellers, beauty specialists, and the vendors of patent medicines. So greatly did the number of these people increase during the reign of James I that an order was issued to all magistrates in the city "to take up all reputed empiricks and Quacks with other offenders of this nature, and bring them before the Censors of the College of Physicians."70

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68H. W. Haggard, Devils, Drugs and Doctors, p. 330.


The College was given the power to punish these people, but few seem to have been prosecuted.

In 1627 John Lambe was brought before the Censors and committed to prison. Following his release, he resumed his practice of fortunetelling. He was frequently consulted, and employed as a tool, by George Villiers, Duke of Buckingham. He supplied the Duke with love philters and other nostrums and somehow obtained much influence over him. When Buckingham fell from favor and as his unpopularity increased, Lambe shared in his disgrace and was commonly known as "the Duke's Devil." One night, after attending a play, Lambe was set upon by a mob, and was so badly beaten that he died from the effects.

Another famous quack was John Case, who had the following lines inscribed over his door:

Within this place
Lives Doctor Case.71

Addison declared in the Tatler that "Case made more money by this couplet than Dryden made by all his poetical works put together."72 As was true of so many quacks, Case offered his advice for nothing but received payment for the medicines he prescribed.

71 F. Bradnack, "The Elizabethan Dramatists and Later Poets on the Principles and Practice of Physic," Medical Record, XXIV (August 18, 1883), 191.

72 Thompson, op. cit., p. 49.
Two oculists rank high in the annals of quackery. Both became oculists to Queen Anne, always a credulous person, who trusted them to treat her weak eyes. One, a Roger Grant, had been both a tinker and an Anabaptist preacher. He attained much success because of the magnificent testimonials which he was able to produce. These he obtained by the liberal use of money. Usually he found some person, preferably a half-wit with poor vision, whom he treated with both his medicines and money. After a period of time he would pay the person a lump sum of money in return for testimony that the patient had been born completely blind and that Grant, with his wonderful medicines, had cured him.\footnote{Harvey Graham, \textit{The Story of Surgery}, p. 221.}

William Read, the other oculist, could neither read nor write. Finding that his original profession, tailoring, did not pay, he set himself up in London as an oculist. By a series of advertisements he became quite well known, and Anne even appointed him oculist to the army and navy. For his services to these groups he was knighted in 1705.\footnote{George Bankoff, \textit{The Story of Surgery}, p. 147.}

Astrology, which was an important phase of medicine during the Middle Ages and formed a part of the regular training of physicians until the close of the sixteenth century, gradually fell into the hands of the quacks. John Partridge was one of the most famous prognosticators. He went to Holland...
during the reign of James II and is said to have qualified as a doctor of medicine at Leyden in 1689. On his return to London he continued the publication of his "Almanacks," which he had published before his sojourn on the Continent and from which he derived a substantial income. Jonathan Swift, however, almost ruined Partridge. Annoyed by the ambiguity of Partridge's predictions, Swift wrote and issued, under the name of Isaac Bickerstaff, "Predictions of the Year 1708," in which he forecast the death of Partridge on March 29. On March 30, Swift was ready with an "Elegy on the Death of Mr. Partridge." In April, Partridge loudly protested that he was very much alive, but the public refused to believe him. Consequently, Partridge was forced to suspend publication of his "Almanac" for several years, and his real obituary seven years later was an anticlimax.75

The quacks had pills for every kind of disease. They had "miraculous Elixirs," reputedly drawn from the "hearts of Mandrakes, Pheonix Livers, Tongues of Mermaids and distilled by contracted Sunbeams," which would cure all dis-tempers of the mind and body. They also sold "Golden Vat-ican Pills" which could cure everything from scurvy to ague, and they advertised a powder which had "made Venus a goddess and kept her perpetually young."76 The most ingenious of

76Thompson, op. cit., pp. 74-117.
these quacks was Doctor Tufts. In order to outdo his rivals in quackery, he invented new diseases which he alone could cure. He announced that he had only recently returned from his travels and that he had discovered several strange diseases for which, though they were not yet known to the world, he had infallible cures. The names of these new maladies were "The Strong Fives," "The Moon Pall," "The Marthambles," and "The Hockogrocle." According to Tufts:

Although the Names, Natures, Symptoms and several cures of these New Diseases are altogether Unknown to our greatest Physicians, and the particular knowledge of them would (if conceal'd) be a vast advantage to the aforesaid person; yet ye, well knowing that his country's good is to be prefer'd to his private interest, doth hereby promise all sorts of People, a faithful cure of all the Diseases aforesaid, at as Reasonable Rates as our modern Doctors have for that of any common Distemper.77

John Ghesel advertised his "Syrup or golden water," which God had communicated to him, describing its power as follows:

... [It] drawes unto it, as Loadstone doth the iron, all hurtfull and vicious humors, from all parts of the body ... so that both young infants and men of riper age at the very point of death have beene maruieously relieued and comforted thereby.78

Smuff, like tobacco, was originally recommended by the quacks as a medicinal agent. It was used as a remedy for toothache and as an "infallible curer of Coughs or Fitsicks, and a preventer of those distempers."79

77 Ibid., p. 110.
79 Thompson, op. cit., p. 260.
Both tea and coffee, when introduced into England, were recommended for their remedial qualities. At London's first coffee house, opened by Pasqua Posee in 1652, this advertisement of the "Vertue of the Coffee Drink" appeared:

It is a very good help to digestion, quickens the spirits and is good against sore eyes. It is good against headache, helpeth consumptions and coughs of the lungs. It is also excellent to prevent dropsy, gout and scurvy, and will prevent drowsiness and make one fit for business.80

It was at Garraway's Coffee-House that tea was first sold as "a cure for all disorders." It was recommended as "the most absolute cure for consumption, and all other decays of Nature whatsoever incident to mankind," and as "a very rich cordial for clearing the heart when oppress'd with melancholy and Vapours." In addition, it was said to be "a special Antidote against any Infection of the Air and if fifteen drops be taken going to bed in a glass of spring water, it never faileth to procure a sound sleep."81

The widespread acceptance of the various medicinal preparations and medical treatments may be attributed chiefly to these factors: the prevalence of superstition and the lack of scientific knowledge. Not all of the recommended treatments, however, were worthless. Medical science today recognizes the therapeutic value of some folk remedies used during the sixteenth and seventeenth centuries. Today we are amused by the credulity with which people accepted the nostrums, pills,

80Ibid., p. 271.  
81Ibid., pp. 271-272.
and elixirs that were compounded and sold by charlatans. Nevertheless, people are almost as credulous today despite the increase in medical knowledge. The truth is that men always seek panaceas and accept improbable remedies in the hope of obtaining quick and easy cures for their ailments.
CHAPTER VII

OUTSTANDING PHYSICIANS AND THE RISE
OF THE ROYAL SOCIETY

Few sixteenth century physicians other than Thomas Linacre and John Caius may be accorded a permanent place in the annals of medical history. Linacre and Caius, however, did much to improve English medical education, which was markedly inferior to that available on the Continent.

The name of Timothy Bright deserves to be included in any list of outstanding physicians of the sixteenth century. His medical works have been completely forgotten, as has his Treatise of Melancholy, which was quickly eclipsed in popularity by Robert Burton’s work. But his name lives in another connection. As early as 1586, Bright had devised a scheme of writing with symbols—an early form of present day shorthand. In 1588 Queen Elizabeth granted to Bright full privileges and rights to his invention in a royal patent.¹ According to Bright’s biographer, W. J. Carlton:

It has been truly said that this book occupies a unique position in the history of shorthand, from which it will probably never be dislodged. It embodies the first published attempt of writing briefer than the

¹W. J. Carlton, Timothe Bright, Doctor of Physick, pp. 71-72.
common longhand, and as such will ever be looked upon as an avant coureur. 2

Another name which is still remembered today is that of Sir Thomas Elyot. Elyot is thought to have taken a baccalaureate in medicine at Oxford; later he became the English ambassador to the court of Emperor Charles V. His writings include a Latin-English dictionary; The Boke Named the Governor, a rule-book for the education of statesmen; and The Castle of Health, in which Elyot described various disorders, emphasizing especially those from which the author himself suffered. 3

Doctor Andrew Boorde (or Borde) was another Tudor physician of some significance. As was customary during this time, his interests were not restricted to the practice of medicine. His writings include Fyrst Boke of the Introduction of Knowledge, a Handbook of Europe, a work entitled Dyetary, the Brevairie of Health, and a treatise entitled Boke of Berdes, which soundly berates the wearing of beards. 4

Another prominent physician of the time was Doctor Walter Bally (or Bayley), one of the Queen’s physicians. It was he who was approached by Anthony Forster, henchman to Lord Robert

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2Ibid., p. 78.


4Ibid.
Dudley, to supply a potion for Dudley's wife, Amy Robsart. Baily refused this request, however, fearing that if "they had poysoned her under the name of his potion, he might . . . have been hanged for the colour of their sin." Baily is also remembered for his work entitled *A Briefe Treatise Concerning the Preservation of the Evesight*, which went through seven editions.

Yet another royal physician was Roderigo Lopez, whose dabbling in politics brought about his downfall. After Essex had accused him of accepting a bribe from Philip II to mix poison with Elizabeth's medicine, Lopez was hanged in 1594.

Another of the Queen's physicians, William Gilbert, occupies an honored place in the history of science. Although a physician, Gilbert is known to historians of physics for his work on magnetism and electricity: his great work was *De Magnete* (1600).

Thomas Vicary, founder of the Barber-Surgeons' Company, is an example of an outstanding surgeon of this era. Vicary's prominence followed a fortunate circumstance. He had been

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7Ibid., p. 1181.

an obscure practitioner in Maidstone who, when called upon
to treat Henry VIII for his "sore legge," had fortunately
cured the royal ailment. This happy outcome enabled Vicary
to rise in the world of medicine; ultimately, he became Ser-
jeant of the King's Surgeons and Chief Surgeon to the King.9

The efforts of Thomas Gale helped to raise the standards
of surgical practice, and to improve the education of the ap-
prentices of the Barber-Surgeons' Company. Gale vigorously
attacked quacks and pseudo-surgeons. His Certaine Works of
Chirurgerie pointed out the errors of the prevalent theories
of Jerome, John of Vigo, and Ferrius concerning the sequelae
of gunshot wounds; like William Clowes, Gale strongly influ-
enced his English colleagues by writing in the vernacular.10

William Clowes is considered by many authorities to have
been the greatest of all Elizabethan surgeons. Leake has
stated that this reputation stems from Clowes' lusty style
of writing rather than from any special distinction of his
surgical technique.11 His writings show much common sense,
however, since he wrote from actual experience. He, too,
attacked the quacks of the time:

... Some of them be Painters, some Glaziers, some Tai-
lores, some Weavers, some Joiners, some Cutlers, some

9Sir Hugh Lett, "Anatomy at the Barber Surgeons' Hall,"
British Journal of Surgery, XXXI (October, 1943), 101.


11William Clowes, Profitable and Necessaire Booke of
Observations, p. xii.
Cooks, some Bakers and some Chandlers. Yea now-a-days it is apparent to see how Tinkers, Toothdrawers, Pedlars, Ostlars, Carters, Porters, Horse-gelders and Horse-leeches, Idiots, Apple-squires, Broom-men, Bawds, Witches, Conjurors, Soothsayers, and Sow-gelders, Rogues, Rat-catchers, Rumagates and Proctors of Spittle houses with such other like rotten and stinking weeds which do in Town and country, without order, honesty or skill, daily abuse both physic and surgery, having no more perseverance, reason or knowledge in this art than hath a goose, and most commonly useth one remedy for all diseases and one way of curing to all persons both old and young, men, women and children which is as possible to be performed or to be true as for a shoe-maker with one last to make a shoe to fit for every man's foot and this is one principal cause that so many perish.  

These, then, are the names of some of the outstanding medical practitioners of the sixteenth century. Their small number and their admittedly modest achievements is in startling contrast with the large number of distinguished physicians and the many medical advances which followed in the seventeenth century.

The major scientific medical contribution of the seventeenth century was by all odds William Harvey's discovery of the circulation of the blood, the epochal character of which can best be appreciated by contrasting it with the conceptions it displaced. Galen taught that the blood originates in the liver, where it is produced by the action of this organ on the food absorbed into the vena porta from the alimentary canal. This is crude blood, endowed only with natural spirits, and it is carried through the vena cava to the right side of the heart. The blood then ebbs and flows between the heart

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12Graham, op. cit., pp. 150-151.
and the great veins, supplying the tissues with the lower requirements of nutrition. Not all of the crude blood behaves in this manner, however. Some of it passes into the left ventricle through invisible pores in the septum. Under the influence of the innate heat of the heart it becomes endowed with vital spirits and then flows through the arteries as "vitalized" blood, supplying the tissues with the higher, or vital, requirements of nutrition. At the same time, the ventricles of the brain are supplied with blood, in order that, with the addition of air, the animal spirits, highest of all, may be produced; these are then diffused throughout the body by way of the nerves.  

This conception prevailed until 1628 when Harvey published his De Mortu Cordis. He brought about a revolution in physiology with the following words:

All things, both argument and ocular demonstration, thus confirm that the blood passes through lungs and heart by the force of the ventricles, and is driven thence and sent for to all parts of the body. There it makes its way into the veins and pores of the flesh. It flows by the veins everywhere from the circumference to the centre, from the lesser to the greater veins, and by them is discharged into the right auricle of the heart. [The blood is sent] in such quantity, in one direction, by the arteries, in the other direction by the veins, as cannot possibly be supplied by the ingested food. It is therefore necessary to conclude that the blood in the animals is impelled in a circle, and is in a state of ceaseless movement; that this is the

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act or function of the heart, which it performs by
means of its pulse; and that this is the sole and
only end of movement and pulse of the heart.\textsuperscript{14}

A number of intellectual obstacles had to be overcome
before this theory of the circulation of the blood received
general credence. First and foremost was the Galenic doc-
trine that there are three different fluids in the body, two
of which are different kinds of blood. Acceptance of Harvey's
theory presupposed acceptance of the idea that two distinct
and separate fluids were capable of mixing with each other.
A further objection was the Aristotelian conception that only
\textit{celestial} matter can move naturally with a circular motion;
all natural \textit{terrestrial} motions must possess a beginning and
an end.\textsuperscript{15} For these reasons, Harvey's discovery did not go
unchallenged. In fact, Harvey's opponents dubbed him a quack,
referring to him as "the Circulator" (a sort of charlatan).\textsuperscript{16}

John Aubrey, who calls him the "Inventor of the Circulation
of the Blood," states:

\begin{quote}
\ldots After his Booke of the Circulation of the Blood
came-out, he fell mightily in Practize, and \ldots 'twas
beleived by the vulgar that he was crack-brained; and
\end{quote}

\begin{itemize}
\item \textsuperscript{14}Charles Singer, \textit{The Evolution of Anatomy}, p. 183.
\item \textsuperscript{15}S. F. Mason, \textit{Main Currents of Scientific Thought},
p. 172.
\item \textsuperscript{16}Sir Humphrey Rolleston, "Harvey's Predecessors and
Contemporaries," \textit{Annals of Medical History}, X (Winter, 1928),
323.
\item \textsuperscript{17}John Aubrey, \textit{Brief Lives}, edited by Oliver Lawson Dick,
p. 128.
\end{itemize}
all the Physicians were against his Opinion, and envied him; many wrote against him.18

But the theory of the circulation of the blood was accepted fairly rapidly, possibly because of the intellectual revolution which occurred during the sixteenth and seventeenth centuries. According to Mason the newer view was that "both the microcosm and the macrocosm were governed by an Absolute Ruler with all other entities in both the great and little worlds enjoying parity of status under the Supreme power."19 The theory of the circulation of the blood and the doctrine of the supremacy of the heart became particular applications of this conception, and through acceptance of this theory the biological sciences were freed to a great extent from "the obscurantism which haunted them so long as quasi-spiritual categories instead of physical and clinical categories, were used in the explanation of the phenomena of life."20

Harvey himself was a selfless scientist, so immersed in his researches that even Aubrey, the most enterprising eavesdropper of the seventeenth century, is unable to give us many interesting sidelights on his life. His lack of interest in contemporary affairs is well illustrated by his action at the Battle of Edgehill. As court physician he accompanied Charles and was given the task of caring for the two young princes at

18Ibid., p. 131. 19Mason, op. cit., p. 175.
20Wolf, op. cit., p. 415.
the fringe of the battlefield. During the battle, and despite the fact that the King's fortunes were at stake, Harvey withdrew to the protection of a hedge and read a book.21

The name of Harvey dominates this period in the medical history of England. There were, however, other men in medicine who, although their reputations have been dimmed by the inevitable comparison with Harvey, are recognized for their contributions to medical science.

One of these men was Thomas Sydenham, best known for his work in internal medicine. In 1642 he entered Magdalen Hall, Oxford, but his studies were interrupted by the Civil Wars, in which he served with distinction as a Puritan captain of horse.22 At the close of the conflict he returned to Oxford to study medicine, and after only six months work he was made a Bachelor of Medicine on order of the Earl of Pembroke, Chancellor of the University. This was an irregular procedure, particularly in view of the fact that he had not received a degree in the arts.23 He then went to Montpellier to continue his studies and upon returning to England received the degree of Doctor of Medicine from Cambridge in 1667.24

21 Victor Robinson, The Story of Medicine, p. 284.
22 Ibid., p. 315.
24 R. H. Major, Classic Descriptions of Disease, p. 143.
Sydenham was unaware of the anatomical and physiological progress that his contemporaries were making, and he stood apart from the main currents of his age. Except for Hippocrates, whom he revered, he avoided reading any medical books. In fact, so strong were his feelings on this subject that when Sir Richard Blackmore, a physician and poet, asked him what books he should read to qualify him for practice, Sydenham answered: "... read Don Quixote, it is a very good book, I read it still."²⁵ Samuel Johnson later suggested that Blackmore was misled by the advice and that Sydenham probably meant that Blackmore would never become a good doctor, no matter what he read.²⁶ Evidently Blackmore was not offended by this remark, for he was exceedingly proud of his personal acquaintance with Sydenham and was his devoted follower.²⁷

Sydenham's theory of medicine was very simple: the human mind was limited and fallible and could not comprehend basic causes; scientific theories, consequently, were of little value to the practitioner, who, at the bedside of the patient, must rely upon his powers of observation and his fund of

²⁶Ibid.
²⁷Albert Rosenberg, Sir Richard Blackmore, p. 147.
experience. Sydenham suggested that disease was a developmental process with a natural history of its own, and he recommended that the physician classify diseases as a botanist classifies plants. The "English Hippocrates," as Sydenham eventually became known, was the standard bearer of progress in practical medicine. His remarkable treatise, The Method of Treating Fevers, may be regarded as one of the main foundations of modern clinical medicine. The material for this work was obtained after years of close study of the various fevers in London. He also gave the first satisfactory description of acute rheumatism, which he distinguished from gout. Sydenham himself suffered from gout and stated in his treatise upon the subject that he had known "severe torment, the inability to move, and other bodily evils." Perhaps his personal experience with the disorder made his description one which "remains unsurpassed." Sydenham also distinguished scarlet fever from measles, and his clinical picture of hysteria and chorea are classic. In therapeutics he was the

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28 F. H. Garrison, An Introduction to the History of Medicine, third edition, pp. 269-270.

29 Major, op. cit., p. 144.


first to popularize the use of quinine, a drug which was strongly resisted by the majority of physicians at that time, and he was the innovator of fresh air for sick rooms and horseback riding for consumptives.  

Sydenham's theories and his work affected medical education and medical practice for more than two hundred years. In Austria, the Vienna Medical School and the so-called School of Natural History were outstanding manifestations of his influence. Indeed, during and shortly after his lifetime he was more renowned on the Continent than at home, and the famous Hermann Boerhaave of Leyden "was wont to take his hat off" whenever he mentioned Sydenham's name. This great clinician, the man who was "the greatest representative of practical medicine of practical England," was not, however, a member of the Royal Society or the Royal College of Physicians--"a little oversight which the College has never ceased to regret."  

Medical science was also advanced by the work of Sir John Floyer, one of the original thinkers of the seventeenth century. In The Physician's Pulse Watch he recorded the first attempt since Galileo and Sanctorius to make observations on

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34 Garrison, op. cit., p. 271.
35 Neuberger, op. cit., p. 234.
36 Stewart, op. cit., p. 466.
37 Major, op. cit., pp. 143-144.
38 Robinson, op. cit., p. 317.
the pulse rate. His experiments led him to use a watch constructed to run for exactly one minute, enabling him to count the number of pulse beats and to note the condition of the pulse in various disorders. 39 Floyer is also known for his work on asthma, geriatrics, and hydrotherapy. He particularly recommended cold baths as a form of treatment, and his Inquiry Into the Right Use of the Hot, Cold and Temperate Baths of England passed through seven editions between 1697 and 1722. 40

Walter Charleton was another well-known physician of the seventeenth century. He wrote the first English text on physiology, which was entitled Natural History of Nutrition, Life and Voluntary Motion. A constant Royalist, Charleton was appointed Physician in Ordinary to Charles II at the time of the Restoration, and possibly in gratitude for this appointment he published his very naive work, A Character of His Most Sacred Majesty Charles II, which in most laudatory terms described Charles as one to whom no interest was so dear as religion. 41

Sir Thomas Browne, another distinguished physician, is remembered today for his contributions to literature rather


40 Arturo Castiglioni, A History of Medicine, p. 648.

than to medicine. His *Religio Medici*, which sets forth a plea for the right of the individual to follow his own conscience in the matter of religion and attempts to reconcile the scientific spirit with faith in the tenets of religion, is still widely read. Three years after the date of its publication, however, it was placed on the list of books prescribed by the Catholic Church. This action by the Church was taken when interest in the work had reached a high point. Some people accused Browne of being a papist; others accused him of atheism; and a Quaker even invited him to become a member of the Society of Friends. As Finch points out, a book capable of producing so many interpretations was naturally deemed dangerous, and it speedily found its way to the Index.

Browne's ability as a physician was apparently about average; he was acquainted, however, with the majority of the famous physicians of the time, and in 1664 he was elected a Fellow of the Royal College of Physicians. Osler does not think that he takes rank with many of his contemporaries and says that one misses the "clear, dry light of science" in him.

He, like many others, never succeeded in escaping from the superstitions of the time, and it was stated that

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42 J. S. Finch, *Sir Thomas Browne, A Doctor's Life of Science and Faith*, p. 5.

the testimony he gave during a witchcraft trial at Bury St. Edmunds helped convict the victims. 144

John Radcliffe was one of the most able physicians of the latter half of the seventeenth century. He often said that when he began medical practice he had twenty remedies for every disease but that toward the end of his career he knew of twenty diseases for which he had not a single remedy. He was an individualist with a shrewd sense of humor and a sharp, insolent tongue. Once he was called upon to treat the wife of Lord Chief Justice Holt, a man he thoroughly detested. Radcliffe paid more attention to the woman than was his usual custom, and when asked why, he replied, "Why, I know that Holt wishes the woman dead, so I am determined to keep her alive to plague him." 145

More than other physicians of the time, he became embroiled in political difficulties. He was a violent Tory, and this political stand may explain his rejection in later years of an appointment as court physician to King William III, although the King offered a salary of two hundred pounds a year. Radcliffe did not even try to obtain the good opinion of the monarch. He expressed himself bluntly and carelessly.

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144 Finch, op. cit., p. 215.

William, who was constantly ill, and whose intemperance further aggravated his already existing afflictions, once consulted Radcliffe about his gouty tendencies. When the King asked Radcliffe what he thought of his swollen legs, Radcliffe replied, "Why truly, I would not have your Majesty's two legs for your three kingdoms." Radcliffe was not consulted again by William.

In December, 1694, he was summoned to attend Queen Mary. It seems fairly well established that Radcliffe, who was considered to be the outstanding authority in England on smallpox and gout, was called in too late to do any good in the treatment of the Queen, whose case of smallpox had at first been diagnosed as measles. He immediately accused the court physicians of wrong treatment, and this accusation precipitated trouble. Bishop Burnet, whose political opinions prejudiced him against anyone who did not share them, made the gravest charges against Radcliffe:

I will not enter into another's province, nor speak of matters so much out of the way of my own profession; but the physicians' part was universally condemned, and

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46 Burton Chance states: "William was an asthmatic and a difficult patient to manage because he would not heed any advice. He probably had tuberculosis which affected the bones of his right arm, and without doubt he was afflicted by chronic pulmonary disease. It is well known that although a good horseman he died from the effects of injuries when thrown by a stumbling horse." (Bulletin of the History of Medicine, XII (July, 1942), 302).

47 H. Lavers-Smith, "Memoirs of Celebrated Physicians Who Flourished in the Reign of Queen Anne," Guy's Hospital Gazette, XV (December 21, 1901), 547.
her death was imputed to the negligence or unskillfulness of Dr. Radcliffe. He was called for, and it appeared but too evidently that his opinion was chiefly considered, and was most depended on. Other physicians was afterwards called, but not till it was too late. It is interesting to speculate that if Blackmore, or some other staunch Whig, had acted as the principal medical advisor, Bishop Burnet would have dwelt less upon the negligence and incapability of the doctor and more upon the hopelessness of the case. Radcliffe, however, was always suspected of being a Roman Catholic, or at least of sympathizing with the tenets of that religion. This was probably due to the favors shown him by James II, and, after the abdication of that monarch, he was looked upon as a Jacobite or partisan of James. It is little wonder that Bishop Burnet found Radcliffe reprehensible.

Indulgence in wine was Radcliffe's besetting weakness, and because of it he forfeited the favor of Queen Anne. A few months after he had been appointed her physician he was sent for by Anne, just as he was sitting down to enjoy a few drinks with some friends. He ignored the first summons, and when finally induced to leave he was heard to complain of the hardships of being called away to attend a woman who was only

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48 Gilbert Burnet, An Abridgment of Bishop Burnet's History of His Own Times, by the Reverend Mr. Thomas Stackhouse, p. 359.

49 J. B. Nias, Dr. John Radcliffe; A Sketch of His Life With an Account of His Fellows and Foundations, p. 21.
suffering from the "vapours" and who "was in as good a state of health as any woman breathing, could she but give into the belief of it." This story was, of course, immediately repeated to Anne, who, in high displeasure, had his name struck from the roll of court physicians.

But Radcliffe had yet another skirmish with the government. In 1711 Harley, the Lord Treasurer, was stabbed by Count Guiscard, and Radcliffe was called in to attend him. Here again the doctor's private animosities were in evidence. He refused to meet Mr. Bussièr, who first dressed the wound, and substituted his own surgeon in his place, thereby, according to Swift, retarding the patient's recovery.

On down to the very end Radcliffe had trouble. In 1714 Anne died, still unreconciled to Radcliffe, who incurred a great deal of odium from the report that he had refused to attend her deathbed when summoned by a messenger of the council. His accusers have, however, overlooked the fact that he was then confined to his country home with a severe attack of the gout and also that the message was sent without the knowledge of the Queen or the Council. Radcliffe contended: "As ill as I was, I would have went to the Queen in a horse-litter, had either Her Majesty or those in commission next to her

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commanded me to do so." Nonetheless, popular feeling ran quite high, and it is said that Radcliffe's life was threatened. In November, 1714, Radcliffe died, and it is said that his dread of the people and the want of company in the country village where he had retired, and which he did not dare to leave, shortened his life. According to his first biographer, Radcliffe "fell a victim to the ingratitude of a thankless world, and the fury of the gout."54

One of the most famous names of the seventeenth century is that of John Locke. Today it is his work, *Essay Concerning Human Understanding*, that assures his fame. Few remember that he was a physician with more than a superficial knowledge of the profession. Locke's interest in experimental research drew him into medical work, and when he was thirty-eight, and after he had spent much time in independent work, he applied for the degree of Doctor of Medicine under the dispensation plan. His petition failed, however, not because of his lack of medical knowledge, but because of his liberal religious views. It was not until four years later, after much practice with a friend, a Doctor Thomas, that he obtained the degree of Bachelor of Medicine. Shortly thereafter Lord

52 Lavers-Smith, *op. cit.*, p. 549.
53 McMicheal, *op. cit.*, p. 30. 54 Ibid., p. 156.
Ashley became his patient. The physician-patient relationship soon ripened into an intimate friendship, and Locke was made physician to the Ashley family and advisor on private affairs. When Lord Ashley, who became the Earl of Shaftesbury, fell from political power, Locke went to France in search of health, for he suffered from chronic consumption and frequent attacks of asthma. When he returned to England after the Revolution of 1688, he was consulted by another famous asthmatic, William III. Locke told him that only strict abstinence would afford him any relief, but William, who apparently considered the cure worse than the disease, refused to follow the advice.56

Locke's most famous medical work was De Arte Medica, in which he tried to formulate the guiding principles of medicine. Here he asserted that the art of medicine would become more proficient only by a closer union of principles with clinical procedure. In this respect he stated that the study of science, chemistry being an example, does not lead to the cure of disease, but that the doctor learns his art by treating sick people rather than from speculative theorems.57 Locke expressed his idea as follows:

> These speculative theorems doe as little advantage the physick as good of men. & he that thinks he came

56 Ibid., p. 413.

to be skilled in diseases by studying the doctrine of the
humors, that the notions of obstructions & putrefaction
assists him in the cure of feavers, or that he by the
acquaintance he has with sulphur & mercury he was lead
into this usefull discovery, that what medicines & reg-
imen are certaine to kill the latter end of some feavers
as they cure in others, may as rationally believe that
his Cooke owes his skill in roasting & boyling to his
study of the elements & that his speculations about fire
& water have taught him that the same seething liquors
that boils the egg hard makes the hen tender, the be-
ginning & improvment of usefull arts, & the assistances
of human life, have all sprung from industry & obser-
vation . . . true knowledge grew first in the world by
experience & rational operations & had this method beene
continued & all mens thoughts beene implicit to adde
their owne tryalls to the observation of others noe
question physicke as well as many other arts, had beene
in a far better condition than now it is.58

These outstanding practitioners were supplemented by an-
other group of men, some of whom were physicians, who banded
together to form the Royal Society. This Society was the out-
come of informal meetings of more or less learned men who were
deeply interested in experimental knowledge.59 As early as
1645 this group met weekly at a kind of luncheon club to dis-
cuss scientific news. It was referred to as "the invisible
college"—a meeting place for serious study without buildings
or professors.60 Even during the Civil Wars some sort of
continuity was maintained, and in 1660, meetings were resumed
in London.61 Charles II took a considerable, if shallow,

58Ibid., pp. 18-19.
59Martha Ornstein, The Role of Scientific Societies in
the Seventeenth Century, third edition, p. 93.
60Dorothy Stimson, Scientists and Amateurs, p. 37.
interest in the organization, and in 1663 he granted a charter to the group. Thereafter it was known as the Royal Society For the Improvement of Natural Knowledge by Experiment, and Charles II was declared the founder and patron.

Dorothy Stimson has suggested that Puritanism was an important factor in promoting the type of thinking that helped arouse the interest in science. She points out that the Puritan emphasis upon a high standard of moral living kept sober men away from the Restoration theater, that these men turned to the new science for their recreation, and that "the study of God's will as revealed in His works in the natural world . . . harmonized with the most rigid Puritan thinking." Other writers believe that the influence which led to the formation of the Royal Society can be traced back through the preceding century, a period when the new or experimental philosophy spread rapidly among those who studied natural science. During the fifteenth and sixteenth centuries a change in intellectual temper had taken place on the Continent, and this change inevitably influenced English thinking in the seventeenth century.

63 Stimson, op. cit., p. 54.
Both Puritans and Royalists collaborated in organizing the Royal Society, and its establishment is a landmark in the history of science. At the outset, however, the Society encountered a good deal of opposition, mainly in the form of ridicule and satire. Samuel Butler, who vigorously satirized Puritanism, also poked fun at the scientists. In "The Elephant in the Moon," he ridiculed them for:

Their learned speculations  
And all their constant occupations;  
To measure and to weigh the air,  
And turn a circle to a square.66

This opposition soon disappeared, and the prestige of the Royal Society was firmly established during the latter half of the seventeenth century. The contributions which the Society's members made to scientific knowledge were legion.

Robert Boyle, whom Bishop Burnet characterized as "a very devout Christian, humble and modest almost to a fault," attacked many physical and chemical problems. He invented a pneumatic engine, which he used to produce a partial vacuum. This enabled him to study the effect of the lowered pressure on shrivelled apples, balloons, and human limbs. Also, with this machine he established the truth of his law that the


67 Burnet, op. cit., p. 47.
volume of a gas was inversely proportional to the pressure to which it was subjected.68

Robert Hooke was probably the most interesting member of the Society. A tireless experimenter, he claimed over one hundred inventions. Among these were the anchor-escape-ment, which brought about a revolution in clock-making, and his balance-spring, which made the chronometer possible. His law of the spring forms the basis for the theory of elasticity as employed by engineers, and his universal joint is an essential feature in transmission gear. He was the first to use zero to indicate the freezing point on the thermometer, and he made improvements in the microscope, telescope, and the air-pump. He achieved less in biology and medicine than in other branches of science; his work on the microscope, however, led to important discoveries in these fields.69

Christopher Wren, another member of the Society, was interested in anatomy and physiology as well as architecture and astronomy. Assisted by Boyle and Doctor Robert Wilkins, one of the founders of the Society, he was the first to attempt the administration of drugs by the intravenous method.70

68 A. R. Southwood, "Robert Boyle and His Influence on Scientific Medicine," Medical Journal of Australia, II (December 5, 1936), 782.


70 A. G. Nicholls, "Natural Philosophy During the Reign of King Charles the Second," Canadian Medical Association Journal, XLIV (January, 1941), 68.
Thomas Willis, another colleague, was the first to note the sweetish taste of diabetic urine and differentiated between diabetes mellitus and diabetes insipidus. In his association of emaciation with sugar-containing urine and his view that it was an affection of the blood rather than of the kidneys, he was much in advance of his time. He also described myasthenia gravis and wrote early accounts of epidemics of typhoid and typhus fever. In his Anatomy of the Brain, he described with accuracy the anatomy of the nervous system and the arterial circle at the base of the brain which bears his name—the Circle of Willis.

Richard Lower, a physician and member of the Society, was particularly interested in the blood, which he differentiated by color as arterial and venous. In February, 1665, he made the first direct transfusion of blood from one animal to another. Pepys was particularly intrigued by these experiments and wondered what change might take place in an English archbishop if blood from a Quaker were transfused into the cleric’s veins. Nothing is known of Lower’s reactions to the speculations of Pepys, but in 1667, he, with

71 Sir Humphrey Rolleston, "Thomas Willis," Medical Life, XXI (April, 1934), 185.
72 Major, op. cit., p. 191.
Edmund King, undertook to change a man's personality by a blood transfusion. The patient, a Cambridge theologian, was described as having a brain that was "a little too warm." He was given the blood of a sheep, since it was a docile animal, and surprisingly enough, it was not fatal. Lower's political affiliation affected his career. A stout Protestant, he joined the Whig party in 1678. Being an honest, sincere man, he did not conceal from the King his politics and his opposition to the succession of James II. Consequently, when the Whigs lost control he lost not only the patronage of the King but also much of his practice.

These men, along with John Mayow, who came close to the discovery of oxygen when he published his tracts on respiration, John Aubrey, John Evelyn, Francis Glisson, Walter Needham, and John Locke, formed the core of the Royal Society. Both amateurs and true researchers, they did much to spread the ideas of experimental science. They devised laboratory facilities, made and improved instruments, experimented along the most varied lines of research, constantly communicated with foreign workers, and established the first organ of international scientific communication through the

75 Maluf, op. cit., p. 65.


77 Nichols, op. cit., p. 68.
Society's "Philosophical Transactions." The Society also promoted scientific research by encouraging workers and by publishing their findings; in short, it supplied the essential aid without which the progress of science would have been delayed for decades. What is more important, however, is that through its existence and work it proved that a new order of things had arisen, that new facts, new methods of work, new interests, were to be recognized in place of the blind acceptance of the authority of the ancients, on the one hand, and crude empiricism or superstition, on the other. The Royal Society, must, therefore, be reckoned as the dominant organization among the pioneer reforming bodies of the century.
Prior to the sixteenth century very little progress had been made in the science of medicine since the Galenic age in Greece. For more than a thousand years, therefore, Europe had been content with a medical system established in ancient times. All branches of learning, however, were stagnant during these centuries. In the Middle Ages there was reverence for authority—authority of the Church in religion, of the aristocracy in politics, of Aristotle, Galen, Pliny, and Pythagoras in science. The learned might explain, but they might not criticize; for whatever had received the sanction of authority became a fixed belief.

The advent of the Renaissance with its revival of learning, the invention of the printing press, the discovery of the New World, and the resultant extension of travel and commerce, the Reformation, the growth of vernacular literature, and the development of the Copernican system which attacked one of the basic dogmas of medieval scholasticism, produced far-reaching changes in all branches of knowledge. In medicine and science the impact of the new forces was particularly significant. Eager scholars read Galen, Hippocrates, and others in the original version instead of the successive
translations which contained many errors. Furthermore, a spirit of critical inquiry developed, and artists like Leonardo da Vinci, physicians like Vesalius and Paracelsus, attacked the doctrines of Galen and the ancients. Vesalius produced a great treatise on anatomy, and Paracelsus taught physicians to substitute chemical therapeutics for alchemy, and he inveighed vigorously against witchcraft, quack surgeons, uromancy, and starcraft—all a part of the old practice of medicine.

It must not be assumed, however, that a revolution in medicine and science was accomplished within a short time. The Galenic system and the authority of the ancients continued to exist during the sixteenth century along with the growing strength of scientific inquiry, although the latter gradually undermined the old order in Europe and England. The prestige of the Italian universities drew scholars from all the European countries and England, and these men returned with new ideas. Linacre, Caius, and Harvey received their medical education in Italy, and their influence on the development of medicine in England has made their names famous in the annals of English medical history.

Slowly the influence and work of these physicians and of others less well known, who also had studied medicine on the Continent, became evident in England. During the sixteenth century some advance was made in surgery, particularly by surgeons who accompanied the armies. Definite progress was
shown in preventive plague medicine, and the quality of medical education was improved. Advancements in English medicine, however, did not parallel the progress made on the Continent during this period, and not until the seventeenth century did England participate fully in the medical renaissance of Europe. Her ability to do so then depended, in large measure, on the work that had been done during the sixteenth century.

From the standpoint of cultural achievement the seventeenth century ranks as one of the greatest periods in the history of western civilization, for it was the age in which the basic concepts of modern science were formulated. Yet, as in the sixteenth century, the old ideas continued to exert tremendous influence despite scientific progress. The eminent physicians, William Harvey and Sir Thomas Browne believed in witches and thought that the death sentence should be given these evil creatures. Yet these men battled vigorously the people who opposed experimental research.

Although England was troubled by religious intolerance, civil wars, and persecution, it was, nevertheless, a fertile ground for the advancement of science during this century. The Italian states were engaged in civil strife and their maritime importance was diminished. In Germany, the Thirty Years' War destroyed the most flourishing cities, interrupted commerce, and ruined industries. In France, the wars
of the Fronde riveted the bonds of monarchy and ecclesiasticism upon the country. England and Holland, on the other hand, enjoyed relative peace and prosperity, and it is in these two countries that science found a congenial atmosphere and medicine had its most flourishing development. Both of these countries had fought their battles with the Catholic Church, and their governments were consequently inclined to be tolerant and to give considerable freedom to those who pursued the study of science.¹

The progress of science in this period in England was only one aspect of a general transformation of English life and thought. The seventeenth century in England was an era of change and progress, of innovations, of new ideas and experiences. It was especially an era of new ideas in politics, geography, physics, economics, and so on. It was also an era of new experience. Seamen and traders returned from far voyages, bringing with them strange and marvellous objects. Men sampled the tobacco that Sir Walter Raleigh brought back from the New World, and they drank hot chocolate, wondering if it would really make them passionate. The impact of these new experiences produced a wider mental outlook, a spirit of scientific inquiry. Men examined the traditional manners and institutions, and criticized them either as having no rational

basis or as being out-of-step with new developments. Perhaps
the chief factor in this revolution of social thought was
the great growth of commercial activity. The trading compa-
nies which had been favored by Queen Elizabeth grew and pros-
pered, bringing wealth into England and with this wealth more
leisure time to consider new ideas. More people read books,
and more books were available in English.

These changes in English life and thought were resisted
by the forces of authority and conservatism and were accom-
panied, naturally, by dislocations and conflicts. Traditional
authority was challenged in every phase of life. Parliament
struggled against the authoritative prerogatives of the throne.
Milton fought for the freedom of the press, and others fought
against authority of religion and for religious tolerance.
Writers struggled against governmental censorship and against
the very real possibility that they and their printers might
be thrown into the Tower of London or deprived of their ears
for producing unpopular pamphlets.

In science the struggle against authoritative tradition
was carried on in the Universities. Scholars began to sug-
gest ideas which were not to be found in classical writings
on scientific subjects, ideas opposed to those handed down
by Galen and Aristotle. Francis Bacon, in accordance with
the new tendencies, anticipated and contributed to a revolu-
tion in scientific methodology by condemning scholasticism
and its "letters os opium on tablets of lead," and advocating an empirical approach to scientific problems. The first year of the century witnessed the publication of *De Magnete* by William Gilbert, an epoch-making work in physics, although quite untraditional and anti-Aristotelian. Thus the seventeenth century in England became an age of new scientific ideas, of experiment and invention, of great scientists and great discoveries, and of a growing realization of the importance of cooperation in scientific endeavor.

Medical science shared in these achievements, but, unfortunately, medical practice did not keep pace with advances in theory. The great discoveries in anatomy, physiology, and chemistry were only slowly and gradually utilized in medical practice. The forces of popular ignorance and superstition prevented both the sixteenth and seventeenth centuries from realizing, except in small degree, the practical benefits of scientific medical knowledge.

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