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THE RENAISSANCE AND ITS INFLUENCE ON ENGLISH MEDICINE, SURGERY, AND PUBLIC HEALTH*

BY

Sir ARTHUR SALUSBURY MacNALT, K.C.B., M.D., F.R.C.P., F.R.C.S.

Fellow of University College, London

Thomas Vicary, Serjeant-Surgeon to King Henry VIII, King Edward VI, Queen Mary, and Queen Elizabeth, Master of the Barbers' Company, four times Master of the Barber-Surgeons' Company, and Surgeon to St. Bartholomew's Hospital, flourished as England's leading surgeon from 1527 to 1562. His life was passed in stirring times. A new world had been discovered by Columbus. Vicary saw the convulsive change produced by the Reformation and the dissolution of the monasteries, the fires at Smithfield and Oxford smoking with the blood of the martyrs, and above all he experienced the influence of the Renaissance and the birth of freedom of thought, individual initiative and action which guided him in his work for British surgery.

It was in the times of Thomas Vicary, then, that a new spirit arose in national thought; and amid a despotic rule, much oppression, and injustice it is possible to trace advances in medicine and surgery, in public health, in social medicine, and in culture and education.

How the "New Learning" came to England

It was not until the value of Greek thought became manifest to the practical Englishman that the influence of the Renaissance became widespread. This heritage was brought to England from Italy by a band of Oxford men known as the *Humanists*. The teaching of Colet, Grocyn, and Linacre, together with the young Thomas More, made Oxford famous as a seat of learning. Bishop Fox in 1516 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 the new learning was established in the universities it influenced national thought and practice.¹

England in Tudor Times

The period of the Middle Ages, it has been remarked, had a childlike simplicity of outlook: it experienced extremes of joy and misery; everything was either black or white. It revered authority—that of the Church in religion, of the aristocracy in politics, of Aristotle, Galen, Pliny, and Pythagoras in science: it was inconsequent and thoughtless, and loved glitter and display. The England of Thomas Vicary's time was the nation's adolescence.²

Under Henry VII trade and manufactures, especially the woollen industry, were encouraged. The wealth in the country increased, but it was in the hands of a new and powerful class—that of the traders. Queen Anne Boleyn's grandfather was a London merchant, and the most powerful Ministers employed by a Tudor king were Wolsey, the son of an Ipswich grazier, and Cromwell, the son of a Putney blacksmith. The old villeinage or serfdom had gone. In the demand for wool the landlords found it more profitable to convert their waste and tilled land into pasture land for sheep. In the words of Thomas More,³ "they thrust husbandmen out of their own and made sheep consume, destroy and devour whole fields, houses and cities." This caused much discontent and unemployment,

and partly explains the popular support which Henry VIII received in the dissolution of the monasteries, which owned most of the land. The abolition of the craft guilds left guildsmen unemployed.

Thus the country in Tudor times was infested with destitute persons. Many became vagabonds, thieves, and murderers. The Poor Law legislation of Henry VIII and Edward VI put the onus of relief on the charity of local districts. It was not until the celebrated Poor Law Act of 1601, which made the maintenance of the aged and invalid poor and the provision of work for the able-bodied a statutory burden on the parishes through the levying of rates, that the problems of unemployment and destitution began to be handled effectively.

The extent of the population in Tudor times can only be broadly conjectured. A rough census was taken at the time of the Armada (1588), and was found to be something under five millions. The population, according to Froude,⁴ had probably approached this figure many generations before. It had been a stationary population, and did no more than keep pace with the waste from disease, epidemics, high juvenile mortality, and civil and foreign war. Wages and the prices of food were regulated, so far as regulation was possible, by Act of Parliament. Wages were high and food was cheap.

On the whole, except for the destitute and the very poor, the standard of nutrition was high. More people probably died of overeating than under-nourishment; for the multitude of clerks, apprentices, retainers, and labourers shared the good things of the tables of their masters.⁵ The Spanish nobles who came into England with King Philip were astonished at the diet which they found among the poor. "These English," said one of them, "have their houses made of sticks and dirt, but they fare commonly so well as the King." "What comyn folke in all this world," says a State paper in 1515, "may compare with the comyns of England in riches, freedom, liberty, welfare and all prosperity? What comyn folke is so mighty, so strong in the felde, as the comyns of England?"

The success as rulers of Henry VIII and Elizabeth lay in the fact that their strength rested in the support of the common people and the middle classes. To this end wages and food prices were controlled, pageants were provided for their amusement, and contentment prevailed. The Renaissance introduced a new style of architecture and there was much building of houses or extensions to existing mansions. These dwellings were surrounded by parks and pleasant flower and herb gardens. The princes built palaces, such as Richmond, Nonsuch, Greenwich, and Hatfield. Cardinal Wolsey's edifices at Hampton Court and Whitehall were both seized and completed by Henry VIII. The nobles, squires, and wealthy merchants followed the royal example, and new colleges were founded and built at Oxford and Cambridge. Dress, as we know from the portraits of Holbein, was ostentatious and costly among the courtiers and the well-to-do.

In various ways the amusement of all classes of society was catered for; there were masques, theatrical performances, archery, athletic sports, fairs, pageants, and shows, bull- and bear-baiting, badger-drawing, and cock-fighting; while public

* The Thomas Vicary Lecture, delivered at the Royal College of Surgeons on Nov. 1, 1945.

executions, whipping at the cart's tail, ducking a scold, and burning of witches and heretics provided more sadistic excitement. Such was "Merrie England" in the time of Thomas Vicary.

Education

The Tudor monarchs encouraged and practised scholarship. Linacre was Prince Arthur's tutor. The Oxford humanists, as we have seen, had established the new learning in the universities. Linacre founded medical lectures which bear his name at Oxford and Cambridge. Yet if it had not been for Sir Thomas Smith, "the flower in his time of the university of Cambridge," the universities might have perished at the Reformation.

Thomas Vicary knew Latin, but was probably not a classical scholar. However, he emphasized the value of a good general education for the surgeon. He was to be reasonably well versed in philosophy, grammar, and rhetoric, and a "lettered" man. Vicary's knowledge of and his affection for the works of Guido de Cauliaco are indicated by the request in his will "unto the hawle of my company one book called Guido." This was probably Guido's *Cirurgia* of 1363. At the grammar schools the boys were taught to read, write, and speak Latin. At a few schools, like St. Paul's, Greek was taught and a little mathematics. The pupils were expected to know how to read and write before entrance—a fact which implies the existence of elementary schools, kept chiefly by the clergy. Tyndale's translation of the Bible into English undoubtedly stimulated the spread of elementary education. On the whole there was less illiteracy among the people of England in the sixteenth century than in the first half of the nineteenth. It may be assumed that the medical student of Tudor times received a reasonable general education, particularly if he went to the university before entering on his professional studies.

Social Medicine and Public Health

In reviewing the general state of England in Tudor times we have noted signs of progressive prosperity in trade and commerce, the abolition of serfdom, and in the main a well-nourished and athletic population. When we turn to the consideration of social medicine and public health the picture is much less favourable, but there are signs of gradual improvement.

It is in Henry VIII's reign that the beginnings of an enlightened public health policy in regard to water supplies can be noted, for in 1532 there was passed the important Act of Parliament (23 Henry VIII, C. 5) which appointed Commissioners of Sewers in all parts of the kingdom. Though much of the work of the Commissioners was riparian in character and directed towards preventing encroachments of the sea, flooding of low grounds, and maintenance of river banks, regulations were also made against trade effluents, deposits of rubbish in rivers, and pollution of rivers, streams, and wells. The larger towns were provided with a regular water-system with public standpipes, and water sometimes was laid on to the houses. London for a long time had been well supplied with water, but under the Tudors seven or eight more conduits were set up from which fresh water was hawked about the streets in barrels. These improvements in water supplies probably owed much to Sir Thomas More, who was appointed one of the Commissioners of Sewers along Thames bank between East Greenwich and Lambeth in 1514.⁷

Epidemic Diseases

There was much disease in England in Thomas Vicary's days. "Surfeits," scurvy, scabies, gout, and stone prevailed, and syphilis was a deadly scourge, as Dr. Johnston Abraham⁸ has shown. Measles, smallpox, tuberculosis, typhus, and dysentery took a heavy toll, but the deadliest epidemics were bubonic plague and the "sweating sickness."

Plague

Plague had remained endemic in England since 1349, the terrible year of the Black Death, which destroyed two million people—half the existing population. At the beginning of the sixteenth century there was a general recrudescence of the disease. From 1511 to 1521 there is not a single year without some reference to the prevalence of plague in the letters of Erasmus and elsewhere.

The chief protective measure was flight from the infected locality, the King and the Court setting the example. Sir Thomas More, in a charge he made to the Mayor of Oxford in 1518, ordered inhabitants infected with the plague to keep in their houses and to "put out wisps and bear white rods." They were forbidden to have animals in their houses, and officers were required to keep the streets of the town cleansed and burn refuse. This procedure was later enforced by the London plague bills of mortality in 1532, parish registers of deaths (1539), and the plague orders of 1543, which were adopted in the Elizabethan regulations. The white wand became the insignia of the "searchers" of infected houses (which had to be marked and closed) and the bearers of the dead. Additional orders later made by the Corporation of London prescribed burning of infected clothing and bedding, cleansing of streets, closing infected houses for forty days, and many regulations about scavenging and sanitation.

The Sweating Sickness

The sweating sickness was one of those mysterious maladies, like influenza and *encephalitis lethargica* in our own time, which suddenly make their appearance, wreak havoc and destruction for a while, and then as suddenly disappear." Five epidemic outbreaks of sweating sickness occurred in England in the sixteenth century. The disease was first noted in August, 1485. In 1502 it prevailed in the West Country, and Prince Arthur probably succumbed to it at Ludlow. In 1507 a milder outbreak occurred, but 1517 saw a third and much more severe epidemic, half the population in a town perishing in some instances. The fourth epidemic, in 1528, was one of great severity. In London that summer the mortality was very great. "One has a little pain," wrote Du Bellay,¹⁰ the French Ambassador, "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 hours, sometimes in two or three, you are despatched without languishing."

The fifth and final epidemic was in 1551, and was well described by Dr. John Caius in a treatise entitled *A Boke or Conseil against the Disease Commonly Called the Sweate or Sweating Sickness* (1552).^{*} It did not cause much fatality among the poor, but chiefly affected the rich and those who were free livers. Caius noted that "they who had this sweat were either men of wealth, ease, or welfare, or of the poorer sort such as were idle persons, good ale drinkers, and tavern haunTERS." Dr. Creighton,¹¹ the epidemiologist, and Dr. Michael Foster¹² considered that the only disease of modern times which bears any resemblance to sweating sickness is *miliary fever* (*schweissfriesel*, *suette miliare*, or "the Picardy sweat"), a malady repeatedly observed in France, Italy, and South Germany, but not in the United Kingdom. It was characterized by intense sweating and an eruption of vesicles, lasted longer than sweating sickness, occurred in limited epidemics, and was usually not fatal. The first epidemic was seen in 1718, and it continued to 1906, and even later. There were 175 epidemics in France alone.

Three Tudor Pioneers in Public Health

Sir Thomas More (1478-1535) is well known as Speaker of the House of Commons, Lord Chancellor, eminent humanist, saint, and martyr. In addition he was a great health reformer. We have to wait until the nineteenth century for a man of equal vision and breadth of view to appear in Edwin Chadwick.

More's friendship with Linacre probably first turned his attention to the problems of public health. His work as Commissioner of Sewers and in controlling plague has already been described. In his *Utopia*, printed at Louvain in 1516, he gave an account of "No-where"—the imaginary Commonwealth of the Renaissance idealists. The citizens of Utopia esteemed health as "the greatest of all pleasures." Inspired by his know-

^{*} I am indebted to Prof. W. G. Hoskins for a reference in Nichol's *History of Leicestershire* (p. 891), wherein is given an extract from the Loughborough parish register for 1551, as follows:—1551, June: "The Swat, called the New Acquaintance, alias Stoupe Knave and Know Thy Master, began 24th of this month." The register then mentions 12 persons who were buried in 12 days, and then goes forward to another page, where it is written at the top, "The Sweat or New Acquaintance," and mentions seven names all buried in three days, in all 19 in six [sic] days. After this it seems to cease.

ledge of the principles of Greek medicine, More³ applied his learning to a description of desirable public health provision in Utopia. He envisaged a well-built city with gardens and open spaces, a public water supply, drainage, and cleansed streets, with public abattoirs outside. Public hospitals were provided for the treatment of rich and poor, and isolation hospitals for cases of infectious disease. Other amenities included communal meals; the safeguarding of maternity with municipal nurses for infant welfare; nursery schools (or crèches) for children under 5; free universal education for all children, with continuation, adolescent, and adult schools; religious instruction, industrial welfare, enlightened marriage laws, and eugenic mating and obedience to the laws of health, including fresh air and sunlight and active occupation without undue fatigue.

It is a comprehensive programme of social medicine which, written in the sixteenth century, expresses many of the aspirations of to-day. If Sir Thomas More had had a wise and discerning master, if that master had given him due authority and powers in administration, England would not have had to wait three hundred years for the initiation of national public health. Instead Henry VIII sent Sir Thomas More to the scaffold.

Sir Thomas Elyot (? 1490–1546), diplomatist and author, was also an enlightened social reformer. He was traditionally an M.D. of Oxford, although no evidence of this is extant.¹³ He was English Ambassador to the Court of the Emperor Charles V, served on several foreign missions, and was knighted by Henry VIII, being the first medical man (according to Dr. S. D. Clippingdale) to be thus honoured. He wrote *The Castel of Health* (London, 1534), a Latin-English Dictionary (1538), and *The Boke named the Governour* (1531), a treatise on the education of statesmen. *The Castel of Health* is a medical treatise of prescriptions for various ailments, and Elyot gives an account of the disorders from which he himself suffered.

The third Tudor pioneer in public health was Dr. Andrew Boorde or Borde (? 1490–1549), traveller-physician—"Andreas Perforatus," as he humorously styles himself. It was at Montpellier that he wrote his *Fyrst Boke of the Introduction of Knowledge*, published ? 1547; the first printed *Handbook of Europe*; his *Dyetary*, published in ? 1542; his *Breuryary of Health*, published in 1547; and his lost *Boke of Berdes* (beards), condemning them. Boorde's *Dyetary* is an excellent manual of hygiene based on his medical experience and full of sound common sense. On nutrition he gives good advice:

"Two meales a daye is suffycient for a resting man; and a labourer may eate three tymes a daye; and he that doth eate ofter, lyveth a beestly lyfe. . . . Also sondry meates eaten at one meale is not laudable; nor it is not good to syt long at dyner and supper. An houre is suffycient to syt at dinner; and not so longe at supper."

He also points out the unwise custom of beginning with heavy meats and only putting on better, light, and nutritive meats when the appetite is assuaged. The prodigious feasts of the time show that little heed was paid to his counsels. The instructions in the book for choosing a site and for the building and hygiene of a country house could hardly be bettered by the textbooks of to-day.

These three men—More, Elyot, and Boorde—were far ahead of their age. Under the rising sun of the Renaissance they grasped the fundamental principles of social medicine, nutrition, and education, and set forth their application in their writings. Much of the seed lay dormant for centuries. It is only in the public health and social reform of to-day that we begin to reap the harvest of their work.

The Hospitals

One of the most evil results of the dissolution of the monasteries was the abolition of the hospitals maintained by the monks for the care and treatment of the sick poor. Sir Thomas More in his *Supplication of Souls* exposed this short-sighted policy, but Henry VIII ignored the advice.¹⁴ By 1539 the total number of suppressed religious establishments was 655 monasteries, 90 colleges, 2,374 chantries and free chapels, and 110 hospitals.

The Corporation of London foresaw the evil that would result, and in 1538 Sir Richard Gresham, the Lord Mayor, asked that the three remaining hospitals, St. Mary Spital, St. Bar-

tholomew's, and St. Thomas's, and, also, the Abbey of Tower Hill, might be placed with their revenues at the disposal of the Mayor and aldermen, so that "all impotent persons not able to labour might be relieved."¹⁵ Nothing was done until 1544, when Henry re-founded St. Bartholomew's Hospital, though he afterwards resumed possession of it. Henry's physicians said the only way of getting the King to listen to reason was to have him fall ill. This was exemplified on his death-bed in 1547, when he made the comprehensive agreement with the citizens which led to his posthumous, if unmerited, distinction as first founder of the five "Royal Hospitals"—St. Bartholomew's, St. Thomas's, Christ's Hospital, Bethlem Hospital, and Bridewell. It was through the efforts of the City Corporation that these hospitals were preserved.

Revival of Medicine

The first beginning of organization of the medical profession in England was undoubtedly due to the influence of Henry's physician, Thomas Linacre, a medical graduate of Padua and Oxford, who had seen the reputation and distinction to which the medical profession could attain in Italy under the star of the Renaissance, and in the interests of the public wished to separate physicians and surgeons from the horde of empirics and quacks. As is well known, he followed up the Act regulating the practice of medicine in London by founding the Royal College of Physicians of London in 1518. The letters patent state that to the establishment of this incorporation the King was moved by the example of similar institutions in Italy and elsewhere, by the solicitations of at least one of his own physicians, Thomas Linacre, and by the advice and recommendation of his chancellor, Cardinal Wolsey. The letters patent were confirmed by Statute 14, Henry VIII. The original founders of the College, John Chambre, Thomas Linacre, Ferdinandus de Victoria—all physicians to the King—Nicholas Halsewell, John Francis, and Robert Yaxley, with the addition of two other physicians, Richard Bartlot and Thomas Bentley, were named Elects, who should yearly appoint from among themselves a President. No person, except a graduate of Oxford and Cambridge, without dispensation, was to be permitted to practise physic throughout England unless he had been examined and approved by the President and three of the Elects.

"It was expedient and necessary to provide that no person be suffered to exercise and practise physic, but only those persons that be profound, sad and discreet, groundedly learned and deeply studied in physic."

The apothecaries were then members of the Grocers' Company, by whom they were regulated. All apothecaries had their wares and medicaments examined by four representatives of the College of Physicians.

As indicative of the influence of the Renaissance in medicine it is to be noted that three at least of the founders possessed foreign medical degrees. John Chambre, a priest, was M.D. of Padua and Warden of Merton College, Oxford; Thomas Linacre, who took orders late in life, was M.D. of Padua; and Ferdinand de Victoria, who was also physician to Queen Katherine of Aragon, had probably a Spanish medical degree. Six of the eight Elects, if not all, were Doctors of Medicine of Oxford, so that this university had the major share in founding the College. Oxford in Tudor times had a prescribed medical course. The M.D. could not be got in less than fourteen years. The Statutes demanded the initial Arts course to the M.A. degree, then a faculty course of seven years.

Several papers have been written by Dr. Goldwin Smith¹⁶ and others with the object of emphasizing the low standard of medical practice in these times. Dr. Edgar¹⁷ and Dr. Pomeranz¹⁸ have pointed out with apt quotations what a poor figure the physician cuts in the plays of Shakespeare and in those of other Tudor dramatists. But the doctor has always been the theme of satire on the stage, from the comedies of Plautus and Terence to *The Doctor's Dilemma*. It has also been remarked that the physicians of the Tudor Age made few contributions to the advancement of medical knowledge. Such a stricture is too severe, when the writings of John Caius on the Sweating Sickness and those of Sir John Elyot and Andrew Boorde are remembered. Queen Elizabeth termed Caius "the most learned physician of his age"—an epithet which posterity has confirmed. Caius was a physician, an anatomist, a great

classical scholar, an antiquarian, and a naturalist. Then there were Edward Wotton (1492-1555), M.D. of Padua and Oxford, the first English physician to publish a systematic treatise on natural history; and William Turner (d. 1568), M.A. Cambridge, and M.D. of Bologna or Ferrara and Dean of Wells, the first Englishman who studied plants scientifically. His *Herbal* marks him as the father of English botany. The Elects of the College of Physicians, Sir William Butts—who interceded with his royal patient, Henry VIII, both for Wolsey and for Cranmer—and others were regarded by their contemporaries as eminent physicians. In their busy professional lives they had little leisure for setting down the fruits of their experience, and what advances they made in the healing art went unrecorded.

The dividing line between physician and surgeon was not clearly drawn under the Tudors. By the Physicians Act of 1540 (32 Henry VIII) medicine was defined as comprehending surgery, and gave the physicians the right to practise surgery when and where they liked. Some of the surgeons practised physic, although this was forbidden by an Act of 1543 which stated: "No common surgeons may administer medicine outward . . . for although the most parte of the said craft of surgeons have small coonning, yet they woold take great soomes of money and doo little therefore; and by reason thereof they doo oftentimes impaire and hurt theyre patients, rather than do them goode."

Caius, as we know, lectured on anatomy, and the Barber-Surgeons enlisted the services of good physicians to teach their members both anatomy and surgery. One of these was Richard Caldwell, M.D.Oxon, F.R.C.P., who with Lord Lumley founded a surgery lecture, the Lumleian Lectures. The Barber-Surgeons' Company, to whom this was first offered, failed to take advantage of it, and the lectureship then went to the Royal College of Physicians.

Other physicians practised obstetrics as well as physic. George Owen (d. 1558), M.D.Oxon, physician to Henry VIII, Edward VI, and Mary, is said to have brought Edward VI into the world by performing Caesarean section on his mother. Owen was President of the College of Physicians in 1553 and 1554, and was the author of a treatise entitled "A Meet Diet for the New Ague set forth by Mr. Owen." (Fol. Lond. 1558.)

Under the influence of the Renaissance Thomas Linacre organized physicians into a fraternity, promoted their education on the lines of Greek thought, and established English medicine as a scholarly and learned profession. He received much help from his illustrious medical contemporaries and immediate successors. The value of this achievement must be measured by its after-fruits rather than by its immediate results in the advance of medical knowledge, though these were by no means inconsiderable.

Revival of Surgery

Many physicians, as we have noted, were still ecclesiastics. So at first had been many of the mediaeval surgeons, particularly among the Benedictines, until the practice of surgery by the clergy was forbidden by the Council of Tours in 1163. In 1279 a College of Surgeons under the patronage of St. Cosmas and St. Damianus, known as the Collège de Saint-Côme, was founded by Pitard, who had accompanied St. Louis to Palestine as his surgeon. It attracted many pupils, and the corporations of surgeons in London and Edinburgh were modelled upon it.

But mediaeval surgery was based largely upon tradition: surgical writings were reproductions of the classical or Arabian authors; and it was not until the Renaissance that surgeons dared to employ independent observation and reflection. Sir Hugh Lett¹⁹ in a previous lecture has shown how the study of anatomy was revived and freed from stereotyped beliefs by Andreas Vesalius (1514-64) of Padua, how anatomy was studied and encouraged at Barber-Surgeons' Hall, and the contribution that Thomas Vicary made to this foundation of true surgery in his administration and teaching, and by his elementary textbook for apprentice-students entitled *A Profitable Treatise of the Anatomie of Man's Body*, which, unfortunately, was based upon the old treatises of Galen and others and did not include the new teaching of Vesalius. Vesalius's great work on anatomy was published at Basle in 1543, and as early as 1545 Thomas Gemini brought out a translation of Vesalius's *Epi tome* entitled *Compendiosa totius Anatomie delineatio* with copperplate engravings copied from Van Calcar's woodcuts. It was dedicated

to Henry VIII. In 1553 Gemini published an English translation of his *Compendium* made by Nicholas Udall, better known as the author of the first English comedy, *Ralph Roister Doister*. This manual was dedicated to Edward VI. The third edition, in 1559, was dedicated to Queen Elizabeth.

Thomas Vicary's work in uniting the Corporation of Surgeons with the Barber-Surgeons and in promoting the teaching of anatomy and surgery led immediately to progress in British surgery. First, as students were well taught by experienced surgeons, operative surgery became much more dexterous and resourceful. This led on to further advances. In lithotomy, improvements were made in the use of the staff and other instruments. A "radical" cure of hernia superseded the application of the actual cautery, operation for stricture of the urethra was improved, plastic operations were done, and ophthalmic surgery was taken to some extent out of the hands of quacks. Trephining was largely practised, even for persistent migraine. Philip William, Prince of Orange, is said to have been trephined seventeen times.

The Company of Barber-Surgeons undoubtedly raised the study and practice of surgery to a high level, organized professional teaching and standards, elevated the social status and general education of the surgeon, and opened a new era in observation and treatment of surgical maladies. Here the highest meed of praise is due to Thomas Vicary and his followers, Thomas Gale and William Clowes.

Conclusion

We have gone back together to the England of the sixteenth century and have tried to realize the times in which Thomas Vicary lived. We have seen his royal patients, bluff King Hal, the consumptive boy King Edward, the sallow-faced tragic Queen Mary, and the red-haired, beruffed, resplendent Queen Elizabeth, with "the body of a weak, feeble woman; but having the heart and stomach of a king—and of a King of England, too." We have met in Thomas Vicary's company the men he knew and who influenced him—the scholarly Linacre, the learned Erasmus, Dean Colet, Sir Thomas More, the saint and martyr, Sir John Elyot, and facetious Andrew Boorde; Sir Williams Butts and other Tudor physicians; and the surgeons, Thomas Gale and William Clowes—all, like Vicary, inspired by the Renaissance and labouring together to improve education, medicine, surgery, and public health so as to leave their country a better place than they found it.

At Vicary's side, in imagination, we have trudged through the ill-paved streets under the overhanging gables of the houses. We have witnessed the ravages wrought by the plague and the "sweating sickness." We have gone into the country, visited the pleasant manor houses, strolled in the flower-gardens, and seen something of the rural sports, the feasting, the jousting, and the maskers and morris-dancers. We have marked the changes brought about by the dissolution of the monasteries, the struggle to maintain the hospitals of London and the Colleges of Oxford and Cambridge, and noted the poverty and destitution which existed side by side with profusion and extravagance in high places. We have passed from mediaeval times into the Elizabethan Age. As Froude said: "Now it is all gone—like an unsubstantial pageant faded; and between us and the old English there lies a gulf of mystery which the prose of the historian will never adequately bridge."

Thomas Vicary lived, like us, in a state of transition, a time of unrest and of social upheaval, when old men dreamed dreams and young men saw visions. It was, as I have endeavoured to show, in medicine, surgery, and public health, not a time of building but of laying foundations well and truly on which a future edifice was to arise; not a time of harvest but a time in which the seeds of knowledge were sown. Linacre organized medicine and Vicary established surgery as learned professions. They thus opened the doors to the light of the Renaissance, brushed aside the cobwebs of the schoolmen, taught the value of independent thought, experiment, and observation, and rendered possible the epoch-making discovery of William Harvey, the investigations of John Hunter, and the triumphs of medical research which continue up to the present day. Equally, we have traced the beginnings of social medicine and public health in the enlightened writings of Sir Thomas More and his administration.

For all this we honour the Oxford humanists and Thomas Vicary to-day. Each in our own way, whether our gifts be great or small, must follow the high aims the Tudor pioneers set before us to maintain health, to prevent and cure disease, and to improve the lot of man.

REFERENCES

- 1 Creighton, M., *The Early Renaissance in England: Historical Lectures and Addresses*, 1903, p. 188, London.
- 2 Salzman, L. F., *England in Tudor Times: An Account of its Social Life and Industries*, 1926, p. 2, London.
- 3 More, T., *Utopia*, 1923, Everyman Edition, p. 55, London.
- 4 Froude, J. A., *Henry the Eighth*, Everyman Edition, 1, 3, London.
- 5 Meade, W. E., *The English Medieval Feast*, 1931, Chap. VIII, p. 214, London.
- 6 *State Papers*, Henry VIII, 2, 10.
- 7 *Letters and Papers of the Reign of Henry VIII*, 1, No. 4701, 1 Feb. 1514.
- 8 Abraham, J. Johnston, *Brit. J. Surg.*, 1944, 32, 225.
- 9 Vergil, Polydore, *Hist. Angl.* (1570), p. 167.
- 10 Du Bellay, Jean, *Lettres et Papiers Ambassadeurs en Angleterre*.
- 11 Creighton, C., *A History of Epidemics in Britain*, 1891, 1, 271, Cambridge.
- 12 Foster, M. G., "Sweating Sickness in Modern Times." *Contrib. to Med. and Biol. Research*, dedicated to Sir William Osler in Honour of his Seventieth Birthday, 1919, 1, 52, New York.
- 13 Monro, T. K., *Science and Action*, 1933, Glasgow.
- 14 Campbell, W. E., *Dublin Review*, Jan., 1945, No. 432, p. 1.
- 15 Davis, Eliza Jeffries, *The Transformation of London: Tudor Studies*, ed. R. W. Seton-Watson, 1924, London.
- 16 Smith, Goldwin, *The Scientific Monthly*, 1940, 50, 65, New York.
- 17 Edgar, J. L., *Medical Life*, 1934, n.s., 41, 331.
- 18 Pomeranz, H., *ibid.*, p. 479.
- 19 Lett, Hugh, *Brit. J. Surg.*, 1943, 31, 101.

For numerous references to Sir Thomas More see:
Routh, E. M. G., *Sir Thomas More and his Friends*, 1934, H. Milford, Oxford University Press, London.

For biographies of the Tudor physicians mentioned see:
Munk, W., *The Roll of the Royal College of Physicians of London*, 1878, Vol. 1.

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BY
J. F. LOUTIT, B.M.
AND
K. MAUNSELL, M.D.

Homologous serum jaundice, which has been reviewed several times recently (Memorandum of Ministry of Health, 1943; leading article, *B.M.J.*, 1944; leading article, *B.M.J.*, 1945), is being recognized with increasing frequency. It occurs 40 to 160 days after the introduction of foreign homologous serum into a recipient. This may be:

Accidental—during routine venepuncture with syringe and needle for blood samples for blood-sugar, B.S.R., etc., determinations or routine intravenous injections (arsphenamine, pentothal, etc.)—called "syringe jaundice." Traces of foreign blood are considered to have been left in the syringe and, through failure to clean and sterilize the syringe, this foreign serum gains access to the subject's circulation.

Deliberate—serum or plasma transfusion, prophylactic injections of measles and mumps convalescent serum or normal adult serum, and yellow-fever vaccination in which human serum is the suspension medium for the killed virus.

The prevention of homologous serum jaundice depends upon the circumstances of the introduction of the serum. In the "accidental" variety—syringe jaundice—adequate cleaning and sterilization of syringes and needles has been shown to reduce the incidence of post-arsphenamine jaundice practically to zero (Salaman *et al.*, 1944). The recommendations of the M.R.C. Syringe Sterilization Committee should be adopted: sterilization of all-glass syringes by dry heat (160° C.) for a minimum of one hour is the method of choice. If unsterile syringes only are available, although it has been recommended that the syringe and needle be withdrawn before the tourniquet is released (Shackle, 1945) to avoid sucking back of blood from the syringe into the vein when the tourniquet is released (Mendelsohn and Wits, 1945a), it is preferable by far that a needle only be used (Mendelsohn and Wits, 1945b; Darmady and Hardwick, 1945). When the introduction of serum is deliberate, prevention of homologous serum jaundice is much more difficult. The yellow-fever-vaccine problem was solved only by giving up the use of serum as a suspension medium. No satisfactory recommendation for the avoidance of homologous serum jaundice due to transfusion or to measles and mumps prophylactic sera has yet been made. MacCallum and Bauer (1944) have noted that it had been their practice to obtain supplies of normal human serum for use in the pro-

duction of yellow-fever vaccine from a panel of donors whose state of health could easily be followed. The sera were always kept for a month before use in order to see whether any of the donors was incubating an infectious disease. Using such sera (apparently unpooled) no case of jaundice caused by the vaccine was reported. It was therefore our intention when collecting sera for measles prophylaxis to follow the donors for two to four months before issuing the sera for clinical use; but for transfusion purposes in the war emergency this was not possible.

MacCallum and Bauer's good results may have been due not to apparently healthy donors but to using unpooled sera. Whereas homologous serum jaundice often follows transfusion of serum or plasma alone or serum or plasma + blood, it appears to be uncommon after transfusion of whole blood alone, although cases have been reported (Beeson, 1943; Steiner, 1944). "It is, however, more difficult to be certain of the diagnosis in such cases. Batches of plasma and serum can be incriminated because multiple cases occur after their use; more or less homogeneous material has been given to many recipients. This does not obtain with whole-blood transfusion, which is a much more individual affair. Unless a single donor's blood on repeated occasions results in jaundice of the recipient, it is impossible categorically to aver that his blood carries a hepatotoxic agent; such a donor has not yet been reported" (*B.M.J.* leading article, 1944).

Investigation into Use of Single Sera

It was decided to investigate the results of introduction of single sera into a number of recipients and to compare the incidence of jaundice, if any, with that in a series of cases which had received only blood transfusion.

Collection of Sera.—Blood was drawn from 99 separate donors, under sterile conditions. 76 (Group I) of these donors had had no previous known attacks of jaundice; 15 (Group II) had had jaundice, apparently infective hepatitis, from some months to many years previously; 4 (Group III) had had homologous serum jaundice some months previously; and 4 (Group IV) were donors who had contributed four bottles of blood which had been the only material used for transfusion to a man with haematemesis who six weeks later developed jaundice. The blood of subjects in Groups I, II, and III (Table I) was

TABLE I.—Follow-up of Donors and Recipients of Individual Sera

Group	Donors			Recipients		
	No.	No. Tested	No. Followed	Complaints		
				Jaundice	Nil	Miscellaneous
I (No previous history of jaundice)	76	462	444	0	433	Bilious attack 8 Skin rashes 3
II (Previous history of infective hepatitis)	15	91	82	0	79	Bilious attack 3
III (Previous history of homologous serum jaundice)	4	24	23	0	23	0
IV (Special cases)	4	25	24	0	24	0
Total	99	602	573	0	559	Bilious attack 11 Skin rashes 3

98 donors followed up 4 months:—94 no complaints; 3 bilious attacks; 1 skin rash; no jaundice.

allowed to clot at 37° C. and the clot to retract. The serum was pipetted off with a sterile Pasteur pipette and stored frozen until used a few days to a week later. The blood of the subjects of Group IV was collected in Nov., 1943, clotted at room temperature, and the serum Seitz-filtered and stored frozen until used for the tests 18 months later.

Method of Administration.—On the day of use the serum was thawed out. A syringe and needle, sterilized by dry heat at 160° C. for two hours, was charged with the serum, and injections of 0.1 c.cm. of the serum were made intradermally with this syringe and needle into a series of four to nine, usually six, recipients.

Follow-up.—In the majority of cases the donors and recipients were followed up personally. At the end of 150 days each was asked by letter to answer whether he had had measles, scarlet

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