Even more stringent measures were sometimes adopted by the sovereign to punish those who were supposed to have carried plague. For example, Queen Elizabeth had a gibbet set up at Windsor on which to hang anyone who had carried the plague or who had harboured infected or suspected persons. Charles I had a gibbet for a similar purpose at the gate of the Court at Woodstock.

There is in all the post-Renaissance period perhaps no parallel for the great interest which Edward VII took in the welfare of the tuberculous. It is well known that, when he saw that at a congress the emphasis had been laid on preventability of the disease, he asked the simple question, "If preventable, then why not prevented?" Since these words were spoken more and more emphasis has been placed on the preventive aspect of tuberculosis, with results which are at last becoming evident.

In recent times the development of public health measures has been assisted in various ways by the interest of the sovereign, but a discussion of these factors would extend this note beyond its legitimate scope. It must be borne in mind that many public health measures can be traced back to the wise reform of the Poor Law by Elizabeth I. So also can measures framed to control the irregular growth of towns. On July 7, 1580, Elizabeth signed at Nonesuch, near Epsom, a royal proclamation which was designed to check the growth of London beyond the boundaries of the City, to prevent the influx of "landless men" to these areas, and to limit the overcrowding which was developing in small rooms. These measures had great influence on later policy.

Royal Healers

In the introduction to this article reference was made to the Royal Touch, and it is perhaps fitting to close with a few brief notes on a practice which was exercised by most of the sovereigns of this land for over six hundred years.

The gift of healing by touching with the hands was supposed to be conferred on the sovereign at his Coronation. The disease treated was nearly always tuberculous cervical adenitis—scrofula, or "the King's Evil"—though other conditions such as blindness were dealt with in early times. In England the practice dates from 1066, when Edward the Confessor "cured" an affected girl. From the time of Edward I the practice increased, and it was formalized in a religious ceremony by Henry VII. Instead of a dole of one penny given to each patient, he gave each a gold "angel," which was hung round the neck. Elizabeth I took her healing duties seriously, but James I, sceptical regarding the efficacy of the method, had to be persuaded that for political reasons it was advisable to continue it.

The peak period of touching was reached in the reign of Charles II, who touched over 90,000 persons in 19 years. He is known to have touched as many as 600 men in a single day. Both Pepys and Evelyn described the elaborate religious ceremony when Charles was touching; on one occasion the crowds of patients were so great that six or seven of them were crushed to death. James II carried on the practice, but William would have none of it. It had a last lease of life under Anne, who saw in it a means of demonstrating her hereditary right to the throne. In the year 1712 she touched 200 persons at St. James's Palace. It is well known that one of these was a child of 30 months who was to become the lexicographer Samuel Johnson. Anne may have "cured" many patients, but she certainly did not cure Johnson, who bore until his death the disfigurement which resulted from scrofula. In this country the practice of touching finally disappeared on the accession of George I, who publicly referred certain applicants to the exiled Stuarts. It is all a fascinating story; but all our knowledge of it is derived from the learned commentary of a distinguished FitzPatrick Lecturer—which, incidentally, appeared in the coronation year of George V—and a full résumé of that work was published in the issue of this *Journal* on the coronation of George VI.

THE MEDICAL AND SCIENTIFIC EXPLOITS OF KING JAMES IV OF SCOTLAND

BY

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Although many kings and queens have been interested in the health of the nations they governed, and have done much to promote the advance of medical science, few monarchs have themselves conducted medical or scientific investigations, and still fewer have actually participated in the practice of medicine or surgery. In ancient times there was the example of Mithridates, King of Pontus in the century before the birth of Christ, one who might almost be called a royal toxicologist, who rendered himself immune to poisons by the self-administration of small doses, and who gave his name to that most famous of antidotes, mithridatum, which, along with theriac, retained its position in nearly every pharmacopoeia until the end of the eighteenth century. And, in more recent days, the practice of "the Royal Touch" in the treatment of "scrofula" or surgical tuberculosis, brought kings and queens into close contact with their afflicted subjects from the days of Edward the Confessor to those of Queen Anne, the strange ritual reaching its zenith in the time of Charles II, who it was said, "touched" more than six thousand persons in a single year (1660).

A story even stranger than that of mithridatum or of touching for "king's evil" concerns King James IV of Scotland, whose medical and scientific activities were perhaps unique in history. In his *Chronicles of Scotland* Robert Lindsay of Pittscottie writes: "This noble King James IV was well learned in the Art of Medicine, and also a cunning Chirurgener that none in his realm, that used that craft, but would take his Counsel in all their Proceedings."

The Personality and Background of James IV

In order to understand his medico-scientific exploits it is essential to know something of the King's character and of the condition of Scotland during his reign.

The young prince succeeded his father, James III, under peculiar and trying circumstances. At the age of 15 he was induced to lead a rebel army against the king, who was murdered as he fled from the battlefield of Sauchieburn, near Stirling, in 1488. It is said that he was so filled with remorse at having been partly responsible for his father's death that he wore a chain of iron around his waist for the remainder of his life. Although recorded to be "temperate in eating and drinking," James IV was a high-spirited youth, of whose various love affairs the most romantic concerned the beautiful Margaret Drummond, whom he might have married had she not been regarded as undesirable by those who favoured an English bride for the King. Accordingly, Margaret and her two sisters, Euphemia and Sybilla, were poisoned in 1501 at their father's house, Drummond Castle, and their tombs may still be seen in the choir of Dunblane Cathedral. Two years later James married Margaret Tudor, daughter of the English King Henry VII—a union of great significance to both countries, because the great-grandson of James and Margaret, James VI, became King of England, Scotland, and Ireland. The most graphic contemporary account of James IV is given by the Spanish Ambassador, Pedro de Ayala, who wrote in 1498, "The King is of noble stature and handsome complexion; he is feared by the bad, and loved and revered like a god by the good." An apt

linguist, he could speak not only Latin, French, German, Italian, and Spanish, but also Gaelic, "the language of the savages of Scotland," as Ayala calls it.

Scotland in the Time of James IV

Scotland was a prosperous country during the reign of James IV. Among the exports were hides, sheepskins, and wool, and large quantities of river salmon. The imports included linen and silk and much wine, though ale was still the chief drink and whisky was as yet unknown, as were tea, coffee, and tobacco. Early in his reign James became aware of the need for strong armed forces. The Scots were ever fighters; indeed, Ayala said that "they spend all their time in wars, and if there is no war they fight with one another, although since the present King came to the throne they do not dare to quarrel so much."

Although they had their amusements, only those which might be turned to military advantage were favoured, and in 1491 a law was passed forbidding "futeball, golfe, or uther sik unprofitable sports," but the practice of archery was still encouraged. The entry in the Accounts, in 1503, recording the purchase of "golfe-clubbes and balles to the King, 9s.," leads one to question whether the law against non-militant sports was very rigidly enforced.

It was at this time that Scotland took its place as a great naval power. The largest of the war vessels was the *Great Michael*, which was built of oak from the woods of Fife and was launched in 1511. All this military and naval activity suffered severely from the battle of Flodden, in 1513, which brought disaster to the Scottish nation and at which King James IV was among the slain. Nevertheless, his was a noteworthy reign marked by a revival of learning and the beginning of systematic medical education.

The Universities of St. Andrews (1411) and Glasgow (1451) had already been founded, but in 1495 the King lent his patronage to the establishment of a university at Aberdeen, the first British university to give instruction in medicine. The individual responsible for this teaching was called the "mediciner," and his salary was £12 a year, besides the right of salmon fishing in the River Don. A few years later, in 1505, the Town Council of Edinburgh granted a "Seal of Cause," or Charter of Privileges, to the surgeons and barber-surgeons of Edinburgh, a document ratified by the King in the following year. In this manner there was established the body which became the Royal College of Surgeons of Edinburgh. Thus King James IV was closely associated with the beginnings of the teaching of medicine and surgery in Scotland.

Another noteworthy cultural event during the reign of James IV was the setting-up of a printing press at Edinburgh

in 1507 by Walter Chepman and Androw Myllar, although it was not until 1568 that the first original medical work in the vernacular was printed, entitled *Ane Breve Description of the Pest*, by Gilbert Skene.

Public Health Legislations under James IV

The mention of "pest," or plague, recalls the fact that bubonic plague was widespread in Scotland at about this time. There were various laws to restrict the movements of travellers in plague-stricken areas, and the importation of English cloth was forbidden. Official scavengers were first employed in Edinburgh in 1499, and the notification of plague was made compulsory in 1505. Still more enlightened was a letter sent by the King to all burghs of Scotland in 1513, which showed that he had given considerable thought to matters of public health. His suggestions included the isolation of plague victims, the expulsion of beggars and vagrants, and the destruction of dogs, cats, and pigs in the streets. Already, in 1497, he had instituted measures for the isolation of those suffering from syphilis, the "Strange seiknes of Nappilis," which, following its dramatic appearance at Naples, had spread to Scotland, where it was known as *grandgore* or *grantgor*.

Treatment was strongly discouraged, probably because the cure, at that time, was worse than the disease.

The King as Medical Practitioner and Dentist

It is unfortunate that the records of the King's activities in the field of medicine are so scanty—derived mainly from the Lord High Treasurer's Accounts. One must be careful to avoid erroneous conclusions, and the fact that the King disbursed various sums to sick

or blind or injured persons need not imply that he was concerned in the treatment. Many payments to doctors or "leeches" are recorded, and also to apothecaries or "pottingers," and more rarely to "surrigicos" or "barbours," as in the case of "ane man new schorne of the stane" at Coupar Angus in 1496, which would appear to have been an operation of lithotomy.

For the most part those payments seem to be merely instances of royal generosity, but there are other entries which indicate clearly that King James IV was not always content to be a mere onlooker, but determined, on occasion, to test his own skill, although he wisely limited his activities to the dressing of wounds, blood letting, and the extractions of teeth.

Of the first mentioned, this is but a single entry, dated July, 1504—"for claith to be wippes to Johne Balfouris sair leg quilk the King helit, 2s." Apparently the King himself was responsible for the healing of John Balfour's leg, and paid two shillings for the surgical swabs or "wippes."

King James IV of Scotland, 1473-1513. (Reproduced, by permission, from the portrait in possession of the Hon. Mrs. Stirling of Keir.)

Still more interesting are those entries which suggest that the King actually paid his subjects for the privilege of allowing him to act as surgeon. Thus, an entry in 1491 is as follows: "To Domynico, to gif the King leve to lat him bluid, 28s."; and it is interesting to note that in the same year the King himself was bled by a "leech," the record stating, "To a leyche that leyt the King blud, 28s." The payment, though of equal amount, is on this occasion the more usual one of patient to doctor, and not vice versa.

James IV also showed a lively interest in dentistry. In 1503 he purchased "ane turcase to tak out teith," and was himself the patient, when he paid "to the barbour that com to tak furth the Kingis tuth, 14s." Not content with this, he must needs act as dental surgeon and pay compensation to the patient, as he had done previously in blood-letting. Thus we find in 1511 an item, "To ane fallow, because the King pullit furth his teth, 14s." And in that same year we discover the strangest happening of all, when the King actually operated upon one of his own barber-surgeons, extracting two of his teeth. The entry states, "To Kynnard the barbour for twa teith drawn furth of his hed be the king, 14s." Apparently the dentist's fee of 14s. was only half of the fee paid for blood-letting, 28s.

The evidence that King James IV practised both of those activities appears to be quite definite, despite the unfortunately scanty record. One wishes that the victims of the royal favour had left some written record of their own feelings.

Experiments in Chemistry and in Aviation

Of the King's investigations in the field of science contemporary records are more informative.

King James's interest in chemistry, or rather in alchemy, coincided with the time of residence in Scotland of an Italian named John Damian, repeatedly designated in the Lord High Treasurer's Accounts as "Maister John," or as "the Franch leich" or "mediciner." He stood high in the King's estimation, and the two collaborated in many experiments. The King paid Damian well, and made him Abbot of Tungland in Galloway, although he had no ecclesiastical qualifications at all. John Leslie in his *History of Scotland* considered Damian a complete charlatan and an "ingenious beguiler." William Dunbar (1465-1530) lampooned him in a poem as "The Feigned Friar of Tungland":

In pottingry he wrocht gryt pyne,
He murdreist mony in medecyne . . .
In leichcraft he was homicyd.

The experiments of the King and the "friar" were concerned mainly with the transmutation of other metals into gold. Laboratories were set up at Stirling and Linlithgow, and the search for the "quintessence" was continued for some years, involving considerable expenditure for coal and wood, and for saltpetre, quicksilver, and aqua vitae. This mediaeval quest by the two alchemists was rudely interrupted by an accident which befell John Damian while he was conducting what must have been one of the earliest experiments in aviation, in 1507. Certainly it was a bold venture on his part to equip himself with a pair of wings made of feathers, and coupled to his shoulders, and, so equipped, to leap from the cliff on which Stirling Castle is built. Indeed, he was fortunate to escape with nothing more than a broken thigh and the loss of prestige. It is recorded that the people who had assembled to watch the experiment "were like to split of laughter," and few sympathized with the unfortunate aviator.

Marooned Children and United Twins

The inquiring attitude of mind so apparent in King James IV is further exemplified in his experiment in the rearing of two children in isolation, which has often been described, but nowhere so clearly as by Lindsay the his-

torian. The King, eager to know in what tongue a child would speak if isolated from the speaking world during its early years, caused two children to be marooned with a deaf-and-dumb nurse on the island of Inchkeith. Lindsay writes, "The King gart take a dumb woman and put her into Inch Keith, and gave her two young Bairns in company with her and gart furnished them with al Necessaries . . . desiring to understand the Language thir Bairns could speak when they came of lawful age. Some say they spak guid Hebrew. But as to my self, I know not." The historian wisely refrains from giving an opinion. Certainly he does not subscribe to the "Hebrew" idea.

During the reign of James IV there was born in Scotland a set of united twins, or "Siamese" twins as we now sometimes call them (after the famous Siamese couple who were born in 1811 and lived for 63 years). The King took a keen interest in the "monster," which had two heads and two bodies, "but from the Waste down, there was but one personage." King James caused "them" to be taught to sing two parts, "the one the Treble, and the other the Tenor, which was very sweet and melodious to hear." They also learned to speak a number of different languages, and lived to the age of 28 years.

Conclusion

Strange as were those exploits of King James IV, there can be no doubt that he was a man of inquiring mind, with a vision ahead of his time. He retained, as few of us do throughout our lives, that gift of curiosity, so valuable as an incentive to education, which seems to be innate in childhood but which grows smaller and less compelling in adult years. James IV of Scotland may well be regarded as a royal pioneer, and not merely a royal patron, of medicine and of science. In the long line of Stuart kings, with their curious mixtures of folly and wisdom, he stands out as one whose advanced views brought enlightenment to his realm and hastened the dawn of a new age. And though his reign ended by his death on Flodden Field it heralded the approach of happier times, of more widespread culture and education, and of steady advance in medicine and science.

"Because peradventure when a sick man hath had his disease at the height he hath at that instant taken *Tobacco*, and afterward his disease taking the natural course of declining, and consequently the patient of recovering his health, O then the *Tobacco* forsooth, was the worker of that miracle. Beside that, it is a thing well known to all physicians, that the apprehension and conceit of the patient hath by wakening and uniting the vital spirits, and so strengthening nature, a great power and virtue, to cure divers diseases. For an evident proof of mistaking in the like case, I pray you what foolish boy, what silly wench, what old doting wife, or ignorant country clown, is not a physician for a toothach, for the cholic, and divers such common diseases? Yea, will not every man withal, teach you a sundry cure for the same, and swear by that mean either himself, or some of his nearest kinsmen and friends was cured? And yet I hope no man is so foolish as to believe them. And all these toys do only proceed from the mistaking *non causam pro causa*, as I have already said, and so if a man chance to recover one of any disease, after he hath taken *Tobacco*, that must have the thanks of all. But by the contrary, if a man smoke himself to death with it (and many have done) O then some other disease must bear the blame for that fault. So do old harlots thank their harlotry for their many years, that custom being healthful (say they) *ad purgandos Renes*, but never have mind how many die of the pox in the flower of their youth." From *A Counterblaste to Tobacco* (1604), written by King James I of England.