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**THE REFORMATION OF ENGLISH MILITARY MEDICINE
AND THE ARMY OF ELIZABETH I IN FLANDERS,**

1585-1603

**A thesis presented in partial fulfillment of the requirements
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ABSTRACT

Queen Elizabeth the First committed an army to Flanders in 1585 to support the cause of the Protestant Provinces of the Low Lands against the Spanish.

It had become established that medical 'practitioners' should accompany armed forces. The practitioners were a polyglot group levied from village healers, licensed and unlicensed practitioners, as well as apothecaries and barber-surgeons.

Despite significant medical and surgical advances on the Continent of Europe, particularly from the advanced concepts espoused by Paracelsus, there is little evidence to support widespread use of new initiatives in the English army. Wounds of a kind new to most 'practitioners' were encountered, due to the introduction of gunpowder-fueled firearms and cannons. Severe and deforming wounds caused by the impact of low velocity bullets were the results of the new battle tactics. Burns from gunpowder mishaps needed new approaches in treatment. Some changes to initiate new concepts in military medicine did occur but were the result of informal pressures, probably learned in the field, and not by formal teaching.

Significant changes in the recognition of the basics of hygiene in the armed forces occurred in the late sixteenth century and some attempts to implement these was found in the army disciplinary codes. The attitudes towards prisoners and wounded were also changing with compassionate treatment being shown to the victims of war. The need for hospitals for the wounded did not develop in England until after the Flanders campaign

The English forces suffered extreme privations due to bad leadership resulting in loss of morale, starvation and desertion. Lack of pay for the troops was a major issue throughout the campaign.

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INTRODUCTION

As a practicing physician, I am frequently in contact with patients who recall a 'family cure' for some particular ailment. The 'cure' rate was at times astounding as the patient recalled and frequently entailed taking the cure with some type of ritual often involving cycles of the moon. Similar stories over the years have caused me to ponder whether modern medical knowledge would be able to determine if significant medical advances had occurred during the 'folk medicine and witchcraft' era in the reign of Queen Elizabeth the First. Did our medical forebears blend their previous learning based on theories of 'humours, vapours, spirits and astrological auguries' to new scientific concepts as they developed?

What better time to attempt to explore this question than in the time of Elizabeth when the cutting edge of warfare was undergoing a major transformation in England and elsewhere. The medical practitioners prior to the Reformation had been exposed for centuries to the cut and slash wounds of spears, lances, arrows and similar weapons. There was now added to the military medical problems the terrible wounds caused by bullets, shot, explosions and shells all derived from the introduction of gunpowder.

Queen Elizabeth had a land and sea war with King Philip of Spain at this critical time. It could be surmised that the army would bring together medical practitioners to exercise their skills in healing both the wounded and the sick. It would be expected that they would bring with them the latest in medical and surgical approaches something that occurs today in wartime. My research has shown that the Elizabethan 'medical practitioners' were mostly a group of 'village healers'.

England was a backwater in developing and utilizing the advances in medical progress. The Company of Barber-Surgeons was the most organized medical group in England. The Royal Colleges of Medicine and Surgery were in their infancy, and consisted of selected men coming together to debate medical philosophy rather than practical steps in improving medical treatment.

The universities of England had not accepted the challenge of changing medical philosophy. In Spain, Switzerland and Germany, the medical practitioners were well advanced in opening new pathways of treatment for medicine and surgery. An enterprising English physician or surgeon who wished to further his skills needed to travel to the Universities of Europe.

Some could assume that progress in the art of medicine in England was related to the fact that more intellectual people were now studying medicine. However this assumption is patently incorrect as many factors are involved in the evolution of any step forward that may lead to better knowledge. Intelligence may be one, however the need to theorize, to invent, to test and to record make up the cornerstones upon which a science is transformed to a higher plane in the evolution of knowledge. To seek answers to medical enigmas represented the nucleus of Reformation medicine and the transmission of the gained knowledge to further practice in peace and war, its objective. Many Continental medical schools had initiated changes in alchemy, anatomy and clinical observation, to explore new knowledge. The challenge was to evaluate from the limited sources if the principles for progress were being followed in England and if so with what effect.

It became obvious that the practitioners of the sixteenth century were not dull witted, indoctrinated only with folklore and dubious secret practices but many were among the intellectuals of their time. The contact between like-minded persons to be able to discuss and to debate matters freely can only occur when communication of ideas can be exchanged. The Royal Colleges and the Universities of England had not developed to this point. In the late sixteenth century the development of the printing presses assisted in spreading knowledge but certainly too late for the ambitious practitioner. For him his skills needed to be learnt on the job. Knowledge was passed down from the scholars who had ventured overseas but it seems clear that 'word of mouth' was probably the most potent means of conveying practice changes. The English soldiers 'in the field' appear often to have initiated a press towards seeking better conditions having learnt from their Continental

colleagues that there were other ways of approach to wounds and overcoming illness leading to better outcomes.

Leaders, both political and military, were discovered on both sides of the conflict who showed varying degrees of care for the well being of their men. Unfortunately to many of these 'great' leaders, the fate of the mere fighting man assumed a low profile, so low that to some it would appear that every fighting man was expendable. In England, this apparent contempt changed during the Flanders campaign between England and Spain as manpower shortages became more recognized. The need to assist the troops to have better health both at war and in peace became a greater issue within the government. I found little to suggest that the medical practitioners were concerned with the situation of the ordinary soldier. Equally there is little evidence to suggest that the English medical practitioners in the army were able to change hygiene practices in the army or to cope more effectively with the intrinsic sicknesses found in the armies of that era.

It would seem that the soldiers expected little assistance from the medical practitioners in the event of illness or wounding. It seems that they would be content with the level of treatment that they would expect to receive in their own home environment.

To the professional soldier and to the army volunteers, the possibility of death or maiming during the course of their service must surely have been an accepted hazard, which they contemplated on the basis of previous experience. The possibility of wealth and promotion to a 'better life' may have played its part. If they became heroes they would receive power, honour and fortune. This was well observed by Matthew Sutcliffe in 1593 when he wrote: -

By great honours, men are encouraged to make great adventures. Men do willingly hazard, and bestow, where there is profit, and honour looked for. There is best service, where there is greatest honour for well doing, and contrariwise where there is no reward, there is no man desireth to be singular. ¹ (Figure1)



THE PRACTICE, PROCEEDINGS, AND

Lawes of armes, described out of
the doings of most valiant and ex-
pert Captaines, and confirmed both
by ancient, and moderne exam-
ples, and precedents,

BY MATTHEVV SVTCLIFFE.

Luke 14.31.

Τὸς βασιλεὺς ἀμεινόμενοι συμβαλεῖν ἑτέρῳ βασιλεῖτι πολεμεῖν, ἕξι κοβίσε
πρῶτον βελιούται' ἢ δευτέρῳ ἵνα ἂν δέκα χιλιάδες ἀπαρτῶσι τοῦ μισοῦ
κοσμηθῶσιν ἰσχυρότερον αὐτοῦ.

What king going to make warre with a forreine prince, sitteth not
downe first, and taketh counsell, whether he be able with ten
thousand, to meete him that cometh against him with twen-
tic thousand?

Cicero, offic. lib. 1.

In rep. maxime conservanda sunt iura belli.

Ibidem.

*Sunt qui quod sentiunt, etsi optimum sit, tamen invidi-
metu non audent dicere.*

IMPRINTED AT LON-
don by the Deputies of CHRISTOPHER
BARKER Printer to the Queenes most ex-
cellent Maiesstie.

1593

Figure 1. Title page of Sutcliffe's 'Lawes of Arms', 1593

The bulk of the armed forces were conscripted. My research shows that the levied soldier from rural and urban society was probably often basically unhealthy and unfit to undertake the hardships of a military campaign in the wet, boggy and the often snow bound areas of Flanders. The records show that the troops were poorly fed, underpaid, disloyal and poorly trained.

Endeavouring to assess advances in the progress of the medicine because of the Flanders campaign has proved to be a difficult undertaking. Records other than those from within the Government are few and fragmentary. Many questions cannot be adequately answered and often suppositions about the health status of the general population because of advances in medical practice can only be inferred. Slowly significant changes in practice did occur and equally slowly the status of the fighting man improved as did the health of the general population.

It is apparent from my studies that there was no great sudden explosion of military medical science. I found that the application of new medical ideas in the military was a gradual process with only a few exceptional men able to achieve greater success than those trained by folk lore and with mystic arts.

REFERENCE

- ¹ Sutcliffe, Matthew, *The Practice, Proceedings and Lawes of Armes*, London, 1593

CHAPTER 1

WHY WAR?

Why did Elizabeth the First mount a military expedition to the Netherlands in 1585? Queen Elizabeth the First of England who reigned from 1558 to 1603 was the second daughter of King Henry the Eighth, who reigned from 1509 to 1547. Henry the Eighth had committed England to Protestantism and although King Edward the Sixth (1547-1553), his heir, was staunchly Protestant, there were strong anti-Edwardian factions who were Catholic in their belief. Although accurate figures are not available, roughly 20% of Londoners were Protestant in 1547, and in the provinces many less.^{1.1} The death of Edward introduced the reign of Queen Mary Tudor (1553-1558), the elder daughter of Henry and a declared Catholic and reintroduced the possible revival of Catholicism. This possibility was made even more plausible by Mary's marriage to Philip of Spain, the then regent of Spain and heir to Charles the Fifth of Spain.

In the Low Lands or the Netherlands, the merchants were wealthy and the cities semi-independent of the rule of Charles, the Duke of Burgundy, later King Charles the Fifth of Spain. Many of the provinces of the Low Lands embraced the new religious freedoms offered by the teachings of the Protestants. Following the abdication of his father Charles in 1556 Philip became King Philip the Second of Spain as well as the titular King of England by virtue of his marriage to Mary. Philip was determined to bring the provinces under his complete dominance by economic and military means. Hand in hand with this desire was the determination of Philip to restore the Roman Catholic faith to the entire Netherlands. The resulting Dutch War of Independence was not formally concluded until the peace of Münster in January 1648.^{1.2}

The year 1585 was a pivotal time in the history of Elizabeth's reign and caused her to change her policy of defensive neutrality towards Spain. The government adopted an open anti-Spanish foreign policy and Spain became

the enemy in place of the traditional enemy, France. Many issues had been fermenting between England and Spain over previous years but uppermost was religious turmoil in England stirred by Mary and Philip and the possible loss of English trade to Europe that could follow if Spanish interests controlled Antwerp. The suspicion grew in Protestant English minds that Catherine de Medici of France and Philip were planning a great Catholic coalition. This was fueled by the arrival in August 1567 of the Spanish main field army of 40,000 men in the Netherlands under the Duke of Alva. Although the army primarily was committed to suppressing the Dutch revolts, it did also set in place a potential Catholic invasion force less than two hundred miles from London. Additionally the army presence tested Elizabeth's commitment to the Dutch Calvinists. Elizabeth had seized Philip's treasure ships in December 1568 when they had sought shelter from storms. She 'borrowed' their bullion that was to pay Alva's troops; he retaliated by seizing English merchants and their property, causing trade embargoes across the channel.^{1,3} The discovery by William Cecil of the Ridolfi plot to land six thousand Spaniards at Harwich in order to depose Elizabeth and enthrone Mary, Queen of the Scots further left little doubt of the extent of Spanish ambition to subdue England, one way or another. In August 1572, the Massacre of the St. Bartholomew occurred with the death of three thousand Huguenots in Paris and a further ten thousand in provincial France.^{1,4} This slaughter placed Elizabeth in the difficult situation of how she could best preserve her Protestant kingdom. Elizabeth was faced with a Spanish monarch and a Spanish military force in the Netherlands under the Duke of Alva who appeared to be invincible as his forces in 1584 had command of fifteen of the seventeen provinces of the Netherlands.

Elizabeth and her Privy Council faced enormous problems in determining the correct policy to adopt in regard to the Netherlands whose fate had reached a crisis point in 1583. It became increasingly clear that Philip was determined to extend his territory to England by invasion using forces launched from Spain and from the Netherlands. He had been actively drawing up plans for an invasion from 29 December 1585; his underlying information told him that English forces were weak and unprepared. He was also informed

that only twelve English counties were Protestant and that the old nobility would rally to him, as would the supporters of Mary Queen of Scots.

The objective of an armada would be to conquer England and thus ensure the reconquest of the Netherlands.^{1.5} It was now not a question if the invasion would occur but when? One of the worst fears of the English Protestants had become true as Alva had destroyed Antwerp as a trading centre by sea blockade and appeared likely to occupy the city with the effect that the sale of English coarse wool to the weavers of Europe would be disrupted. Elizabeth would face serious economic problems if Antwerp were lost as this would cut off England's main overseas revenue stream. Elizabeth's money problems were always severe, in part inherited from the costly military campaigns under Henry the Eighth and Mary.

In the darkest hours of the revolt of the Netherlands, the remaining viable military provinces left to oppose the Spanish were Holland and Zeeland held together by Prince William of Nassau and Prince of Orange. In 1583, William turned to Protestant countries for aid and in particular to Elizabeth who was again offered the sovereign's role in the Netherlands on 12 May 1585. She refused this offer as she had done previously in 1576. She had previously committed funds to William to assist his struggle, by giving 1,000,000 florins during 1578-79. Some of this sum was provided not in cash but as alum, a material used for dye fixing and also in textile manufacture and vital to Antwerp's wool industry.^{1.3} She had also sent a few hundred soldiers to the Netherlands in 1572 but these were soon recalled.^{1.7} Certainly these actions caused her policy of defensive neutrality to be stretched to their limit.

In October 1584 the Privy Council decided that military aid would need to be offered to the Dutch. Elizabeth received a delegation from the States-General and the Treaty of Nonsuch was drawn up and signed on 20 August 1585, committing England to deliver an army for the defence of the United Provinces. Three months previously on 10 July, William, the leader of the Dutch Revolt, had been assassinated causing panic among the English politicians that Elizabeth may suffer a similar fate.^{1.8} As part of the treaty,

England would provide a governor-general who was to be advised by a new Dutch Council of State. He was to direct the war and coordinate government of the Netherlands. In addition, England would pay 600,000 florins a year towards the cost of the war. Elizabeth, in keeping with her nature, did not undertake this commitment lightly. She required guarantees from the Dutch who were to surrender Flushing, Rammekens and Brill as sureties for money to be spent by her; these towns were termed 'the cautionary towns'.^{1.9} The choice of these towns was to put in place an effective blockade of the river Schelde and hence the gateway to Antwerp.

The agreement was to provide an English army with a field force of 5,000 men, 1,000 cavalry and 1,150 men for garrison duties in Flushing and Brill, in all 7,150 men. This undertaking effectively placed England at war with Spain.

The exact numbers of men in the first levy are lost.^{1.10} Parker however records that 6,350 men were to be raised.^{1.11} A distinction into infantry and pioneers is not recorded. Robert Dudley, the Earl of Leicester, was appointed to be the governor-general and he commenced to raise the initial military force in the traditional feudal way by levy of the men mostly initially from his own estates. A force of 4,100 men was at Flushing at the mouth of the river Schelde on 14 September, but too late to save Antwerp, which surrendered to the Spanish on 17 August. The force had been increased to 8,000 by December 1585.^{1.12} In the last week of August 1585, the professional soldier and English 'volunteer' captain, Colonel John Norreys, had a force of 2,000 at Middelburg, the capital city of Zeeland and close to Flushing.^{1.13} Sir Philip Sidney was to be the governor of Flushing and commander of the garrison. Sir Thomas Cecil was to be in command of Brill.^{1.14}

The need for widespread levying of men raised considerable objections within England. There was a need for an Act of the Privy Council in February 1586 to deal with the recusants, who objected to conscription. The Act remarked on 'Yeomen and others of strong and able bodies, by whose evil example and obstinacies divers of the common and inferior sort are daily, led and perverted'. Following this Act, it was suggested that one group of 200

recusants should be sent to Leicester in the Low Countries to be employed as pioneers.^{1.15} The wording suggests that the compulsion to go to the Netherlands could be regarded as a punishment.

Following the example set from the time of Henry the Eighth in earlier campaigns the military force would be accompanied by a medical contingent. The guidelines laid down during the Marian era suggested that the appropriate medical establishment be considered to be in the order of 1 medical practitioner to each band of 100 men.^{1.16} The requirement for medical practitioners compatible with this ratio would be seventy-five medical practitioners recruited for army service for the Flanders campaign. The Barber-Surgeons Company was expected to provide practitioners under the understanding made by the receiving of its charter from King Henry the Eighth.

Prior to 1585, Tudor England had been engaged in relatively small-scale military campaigns against the Scots, the French and the periodic Irish rebellions. The involvement in war in the Netherlands was to become an ongoing 'black hole' for England, testing her manpower resources to be able to continue to supply her forces with men and materials. It would also highlight the inadequacies of the recruiting systems to muster men to defend the realm as well as the poor leadership and the inadequacies of her military advisors.

Elizabeth and England were forced to undertake military action to give forward protection against invasion, to aid the only effective anti-Spanish fighting force in the Netherlands, and to endeavor to maintain trade links and to defend Protestantism.

REFERENCES

- ^{1.1} Guy, John. *Tudor England*, (Oxford University Press, Oxford, 1988), p. 204
- ^{1.2} Parker, Geoffrey. *The Dutch Revolt*, (Penguin Books, London, 1977). p.216
- ^{1.3} Guy, John. *Tudor England*, (Oxford University Press, Oxford, 1988), p.276
- ^{1.4} Ibid, p. 276
- ^{1.5} Ibid, p.338-339
- ^{1.6} Parker, Geoffrey. *The Dutch Revolt*, (Penguin Books, London, 1977).p.216
- ^{1.7} Ibid, p.216
- ^{1.8} Guy, John. *Tudor England*, (Oxford University Press, Oxford, 1988), p.286
- ^{1.9} *Calendar of State Papers*. (Foreign Series, Elizabeth), Preface. Ed. S.C.Lomas, 1901.p.6

- 1.10 Cruickshank, C. G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p.1
- 1.11 Parker, Geoffrey. *The Dutch Revolt*, (Penguin Books, London, 1977). p.217
- 1.12 Ibid, p.218.
- 1.13 Guy, John. *Tudor England*, (Oxford University Press, 1988), P.287
- 1.14 *Calendar of State Papers*. (Foreign Series, Elizabeth) Preface. Ed S. C. Lomas, 1901, P.41.
- 1.15 *Acts of The Privy Council*, Preface, New Series, (H.M. Stationary Office, London, 1897), 14:14.
- 1.16 Cruickshank, C. G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p.118

CHAPTER 2.

ENGLISH MILITARY MEDICINE PRIOR TO 1585

In the two centuries prior to the Flanders campaign an understanding developed that a medical presence would be part of any recognized military force. How this understanding came about was by obligations placed upon the licensed practitioners to perform their duties to the Crown when called upon. This is clearly expressed in the case of the Barber-Surgeons under their charter obligations.^{2.1} However filling the desired ratio of 1 surgeon to 100 troops could not be achieved from the ranks of the Barber-Surgeons alone.^{2.2} In 1577, a levy put upon the members of the Barber-Surgeons Company to equip troops recorded only 90 persons on the roll and in the 70 years from 1603 enrollment averaged only 48 freemen and 133 apprentices per annum.^{2.3} The assistance of medical aid in the field had been slow to be recognized as being desirable. No standards had been set to determine which persons were thought to be adequate for military service and the declaration that some of the levied person had healing skills was probably adequate for them to be regarded as medical practitioners.

In earlier English military expeditions, physicians were often part of the personal retinue of the King or came as attendants to the commanding officers and/or his officers. In 1346, one surgeon, who was actually on the staff of the Prince of Wales, accompanied King Edward the Third on campaign.^{2.4} King Henry the Fifth (1413-1422) was accompanied by a physician and a surgeon who were authorized to expand their staff by recruiting further staff and instrument makers. The recognition of the need for the skills of an instrument maker shows that there was a place in the forces in the field of war for splint and crutches makers who also could repair and manufacture new instruments. Various illustrations of war scenes from the time show amputees using crude crutches. In the field of battle and subsequently, only very low level surgical appliances could have been made for the more exotic items would require a workshop to manufacture the instruments needed by the surgeons.

In 1474, King Edward the Fourth took twelve surgeons to his French campaign. The surgeons were somewhat stratified as one enjoyed the title of 'King's Physician' and another 'Physician and Surgeon to the King's Body'. It may be asked who attended to the needs of the lesser ranks? There is a silence about this matter. Is it appropriate to assume that the 'buddy' system operated, with a colleague tending to his wounded colleague?

By the time of the ascent to the throne of Henry the Eighth, the presence of medical practitioners was probably expected as part of the normal army contingent. He had campaigns in France in 1513, 1522, and 1523 and in 1544.^{2.5} It is not clear how many practitioners were included in his forces. The need for medical attention had been formally recognized by the obligations placed upon the Barber-Surgeon Company in the reign of Henry and the ordinances drawn up by the then Lord Chancellor, Sir Thomas More and delivered to the Company on the 21 October, 1530. The ordinance required that the Barber-Surgeons adhered to the direction 'Ye shall be good and true unto oure leige Lorde, the Kinge and to his heirs'. The recognition that they were leigemen placed upon the Company an obligation that it would supply practitioners to the Crown upon request.^{2.6} The Barber-Surgeons under the same ordinance were obliged to take oaths and assume many obligations among were to teach their skills to apprentices, to pay dues and to attend the dying when called upon.^{2.7} The Company received an inspeximus charter ^A from Philip and Mary on 8 June 1558.^{2.8} and one from Elizabeth on the 6 January 1560.^{2.9} This obligation was therefore in effect and was adhered to by the Barber-Surgeons Company during Elizabeth's Flanders campaign.

One of the biggest mass military operations that had occurred in Henry the Eighth's time involved John Dudley, then titled Lord Lisle, (subsequently Duke of Northumberland) who had founded the Navy Board as First Lord of the Admiralty (1549 -1553). He was responsible for delivery of Henry's army of 42,000^{2.10} men across the channel in July 1544. There appears to be no information regarding medical presence in the Army. However under the

^A An inspeximus charter is one in which the grantor avouches to have inspected an earlier charter which he recites and confirms.

obligation given under the charter of 1530, the Barber-Surgeons had been chartered to provide surgeons.

From the time of the campaign at St. Quentin in 1557, thirteen years later, it is known that the accepted ratio of practitioners to troop force was 1 practitioner to 100 men.^{2.11} If this ratio had evolved from an earlier time than 1544, it would have been the benchmark. If this ratio adhered to, it would require that there should have been forty-two practitioners for the army, a requirement that would be beyond the ability of the Company to fill. The Company was also to provide naval surgeons when called upon. The definition of medical practitioners as advocated by Pelling seems to be very appropriate. Any person who purported to give assistance to the ill and 'whose occupation involved healing the sick' were practitioners in the absence of any other 'more qualified' practitioners.^{2.12}

Pelling and Webster investigated the records of London and Norfolk to assess the medical workforce in the sixteenth century. Norwich in the sixteenth century was the second largest city in England with a population of about 15,000 persons. The review suggested that there were seventy-three licensed practitioners to undertake treatment, giving a ratio of 1 to every 200 to 250 persons in Norfolk.^{2.13} In London, between 1580 and 1600 there were about 500 practitioners to serve a population of 200,000 persons, that is 1 per 400 of the population.^{2.14} The number of other licensed and unlicensed practitioners was estimated as at least 250 in the London area alone in 1580-1600.^{2.15}

It would be quite acceptable to the troops if unlicensed practitioners gave assistance during their army service and particularly on the battlefield as they were trusted outside of the army and in their everyday civilian experience. These troops had been recruited by the quasi-feudal means of the time early in the conflict. In Henry's time, most noble households had a barber-surgeon on the staff who occupied a low position within the household. He was required to attend to the needs of the household and it was his duty to

accompany his lord to war. His wages were up to fifteen shillings per month and he was provided with a suit of livery^{2.16}

Accepting the concept advocated by Pelling that any person who offered assistance to the ill or injured could be regarded as a medical practitioner then the practitioners can be considered to fall within seven groups.

- A. The village practitioners.
- B. Fellows of the College of Physicians.
- C. Members of the Company of the Barber-Surgeons.
- D. The apothecaries.
- E. The licensed practitioners.
- F. The unlicensed practitioners.
- G. The clergy.

The feudal system of recruiting could take up any individual who may then profess to the recruiting officers that he possessed healing powers and then he may have been classified as a medical practitioner for the purpose of military service.

A. The village practitioners would be very knowledgeable about civilian sicknesses and as the military would be subject to ordinary 'everyday' illnesses, their expertise would be of considerable value. For injuries and cutting wounds they too would be able to give assistance. They may have been less familiar with the gunshot wounds and the burns resulting from gunpowder. Some recognized Barber-Surgeons, Paré^{2.17} among others, (see page 124) suggested that these should be treated like any ordinary burn and the village practitioner may have done well to use his accustomed simple healing arts. They were probably very familiar with domestic burns, an everyday hazard when domestic warmth and cooking depended upon the hearth. They would be very familiar with the sickness associated with the virulent epidemic of 1551, 'the sweats' which was possibly typhus. In 1563, other epidemics occurred variously labeled as 'the plague', 'the flux' and 'spotted fever'. They would be well aware of classical famine diseases, various types of bubonic plague, typhus, and the 'pining sickness' which was

probably tuberculosis.^{2.18} They could not have escaped the experience of needing to give assistance during the 1555 epidemic of an illness, which intensified during 1558-1559 and was probably, a major influenza epidemic. It was suggested that some of these epidemics were brought into England by returning soldiers.^{2.19} The date 1558 is significant for the influenza epidemic as it was the year of the fall of Calais on the Continent so was the disease brought from France?

An uncertain group to place within the army would be the soothsayers, mystics and fortunetellers but even these people may still have found their place in the overall treatment scene. The belief in malicious spirits, fairies and witches who cast spells and curses on the unwary remained widespread throughout the sixteenth century. The powers of witches were not challenged until the publication of 'The Discovery of Witchcraft' by Reginald Scot in 1584 only shortly before the Flanders campaign.^{2.20} (Figure 2). Women practitioners were at great risk of being classed as witches. A witch in essence was supposed to have a secret compact with the Devil but as Reginald Scot put it:

In the estimation of the vulgar people it (witchcraft) is a supernatural work contrived between a corporal and a spiritual devil. The manner thereof is so secret, mystical and strange that to this day there hath never been any creditable witness thereof. Butter would not churn not because the witch has cast her spell over it but either the maids have eaten up the cream or the goodwife have sold the butter before in the market.^{2.21}

Within the village structure there existed 'wise' women who attended to births as village midwives but undoubtedly were consulted about the cause of ailments and their cure. It must be recalled that most armies had with them a 'train' of followers offering items of need to the troops but also probably healing skills. In long campaigns, some military wives accompanied their husbands and may have had need of midwives and to aid during the suffering of illnesses that they may have felt were in the province of the 'wise' woman.



The discoverie of witchcraft,

Wherein the lewde dealing of witches
and witchmongers is notablie detected, the
knauerie of coniuors, the impietie of inchan-
tors, the follie of soothsaiers, the impudent fals-
hood of couenors, the infidelitic of atheists,
the pestilent practises of Pythonists, the
curiositie of figurecatters, the va-
nitie of dreamers, the begger-
lic art of Alcu-
mystric,

The abhominacion of idolatrie, the hor-
rible art of poisoning, the vertue and power of
naturall magike, and all the conuiciences
of Legierdemaine and iuggling are deciphered:
and many other things opened, which
haue long lien hidden, howbeit
verie necessarie to
be knowne.

Heerevnto is added a treatise vpon the
nature and substance of spirits and diuels,
&c : all latelie written
by Reginald Scot
Esquire.

I. Iohn. 4, 1.

Belieue not euerie spirit, but trie the spirits, whether they are
of God; for manie false prophets are gone
out into the world, &c.

1584

Figure 2. Title page of Scot's 'Discovery of Witchcraft', 1584

The role of women in the military forces may have varied with the nature of the campaign. Many women were involved in the healing professions. Thomas Gale estimated that sixty women practitioners were active in 1560. He wrote in his text: ^{2.22}

Three score women, that occupieth the arte of physick and chirurgerye. These women, some of them be called wise women, or holy or good women, some of them be called witches, and useth to call upon certain spirits, and some of them used plain bawderie, and telleth gentle women that cannot bear children how they may have children.

Some women were surgeons, and apothecaries, others were collectors of the mortality registers. Parishes regularly employed nurses to care for orphan children; to give lodgings to the sick poor, there were wet nurses and children's nurses. ^{2.23}

In the army of Flanders, the nurses and nursing aids were recognized in the orders of Leicester. The Elizabethan disciplinary codes were all developments of earlier codes and evolved prior to 1585. ^{2.24} The disciplinary code of Leicester as used for the Flanders campaign, paragraph 5 states: ^{2.25}

And for that it often happeneth, that by permitting of many vagrant idle women in an armie, sundry disorders and horrible abuses are committed: Therefore it is ordeined that no man shall carrie into the field, or deteine with him in the place of his garrison, any woman whatsoever, other than such knowen to be his lawful wife, or such women to tend the sicke and to serue for launders, as shall be thought meete by the Marshall, upon paine of whipping and banishment.

The midwives were also under the licensing rules of the church but this requirement was not always enforced. The midwives were surely also those available for the examination and treatment of females in the practical world. Leicester's rules have made it clear that there were females with his forces as

wives and nurses. Wise women and midwives were almost certainly among these.

B. Fellows of the College of Physicians. A Charter from 1518 was granted by Henry the Eighth authorizing that a College of Physicians be established. The university educated physician was a scholar, proficient in languages, who had usually spent up to seven years preparing for a preliminary M.A. followed by a further seven years or more acquiring medical knowledge both in English and European medical schools. He then had to satisfy the selection procedures for Fellowship of the College of Physicians. As Pelling and Webster point out this profile then allowed the physician:^{2.26}

To claim a dignified position in society, dress according to this rank, and establish his right to charge high fees, and to dominate all inferior groups within the medical profession^{2.27}

The number of physicians was small and the College functioned as a 'debating club' although the College took upon its self the role of mentoring the activities of the other 'practitioners'. Under an Act of 1540, the College had authority over both apothecaries and surgeons; both groups resisted the College intrusion.^{2.28} The College was small and was not particularly influential and did little to influence medical education and scholarship until the 1580's. Of the physicians who trained overseas, only one, Thomas Linacre, became an effective exponent for the need for advanced training centers in England. It was not until 1565 that Elizabeth allowed the College to dissect human bodies on its premises.^{2.29} Elizabeth granted the bodies of two criminals for this purpose.^{2.30} The lectures from the human dissections could be supplemented by the early availability of illustrations of anatomy by Thomas Gemini, a Flemish printer who published in 1545 copperplate woodcuts of anatomical dissections. The text 'Compendiosa toticis anatomiae delinecto' was in Latin initially but was subsequently published in an English text in 1552 and in 1559, the latter was dedicated to the young Queen Elizabeth. This text is likely to have been used by Thomas Vickary (died 1561)

in his lectures as part of his duties as Master of the Barber-Surgeons Company in London a position he held for his five terms as Master.^{2.31}

It is recorded in the Acts of the Privy Council ^{2.32} that because of the constant sicknesses found in the poorly equipped navy, the College of Physicians was asked by the Council to send down doctors to the fleet to provide advice and therapy. The Council mentioned the reputation of Gilbert, Marbeck, Browne and Wilkinson. The president was asked to choose two of them to care for 'the noblemen, gentlemen and others in that service' and to take with them such 'drouques as should be fit for medicines and cure'

C. The Company of the Barber-Surgeons was to provide the bulk of the medical practitioners under the Charter granted by Henry the Eighth. They were recognized for their art and skills and had evolved from their very early roots as barbers and assistants to monks who were forced to withdraw from their traditional role in healing the spirit and also the body by the Papal Decree of Alexander the Third in 1163.

The barbers were an incorporated body from 1462 and their place in the healing craft was well established in the public mind and the community and the military would regard them as craftsmen in their skills. Despite this recognition as skilled healers, records from 1574 show that surgeons were continually being called before the Court for 'evil dealings' with their patients and for not performing the cures for which they had received payment beforehand. If clearly guilty, the surgeon was either subjected to a fine, imprisoned or forced to compensate.^{2.33}

D. The apothecaries. Their role in the military is unclear as there are no records of their obligations to the military during the sixteenth century. Until 1607 when they formed their own Guild, they had been accepted as part of the Grocers Company. The Worshipful Society of Apothecaries in London was not set up until 1617 and no records are available of their military commitments prior to this time.

Some apothecaries appear to have a dual role practicing as both apothecaries and as medical practitioners, both licensed and unlicensed. As many of the therapeutic items which army surgeons required were compounded from herbs or 'simples' and chemicals, it is likely that they functioned with military forces as suppliers and were likely to have been classed as medical practitioners.

In the military, the supply of medicines would have been obtained from the apothecaries and the grocers or made up by the surgeons in the field from their own resources. How many apothecaries were among the 'medical practitioners' in Flanders is not clear. The impressing system for levying forces makes it likely that they were present and likely to have been able to continue in their traditional role.

Certainly their status as practitioners was recognized by the nobility in 1554 may be judged by an account for £5 required to be paid by Robert Dudley on behalf of his mother Jane Dudley, the Duchess of Northumberland for services provided.^{2,34} Queen Elizabeth had a court apothecary, William Morgan who was the apothecary to her in 1585. The need for apothecaries in her armies would be looked on as mandatory for any medical service.

Included in the therapeutic armory of the apothecaries and the Barber-Surgeons were certain 'cure-alls' whose use would have been among the expected therapy items for the wounded as well as for the basic 'sick'. Two of the items were stock remedies, which survived well beyond Elizabethan times. One of these was 'theriac'. The name is derived from the Greek 'thrice' derived in turn from 'thereon', wild or venomous animals. The word remains today in the words therapeutic and therapy.^{2,35} In the English vernacular it became known as treacle and as such has no relationship to the molasses based modern substance. The second of the universal 'cure-alls' in Tudor times was 'mithridatum'. This name was said to have originated from the compound reputed used by Paul of Aegina as the 'mithridatic antidote'. Certainly theriac had been used in the time of Chaucer as The Pardoner in the Canterbury Tales mentions 'triacle' for the treatment of palpitations.^{2,36}

Both of these compounds were required to have a minimum of fifty ingredients. In 1518, the manufacture of both theriac and mithridatium was under the supervision of the College of Physicians.^{2.37} In Elizabethan times William Bess, an apothecary with his shop in the Poultry compounded these. It was required that he should display the finished product to the College of Physicians.

In 1561, only three years after her accession, Queen Elizabeth was thought to be in great danger from poisoning. She was 'dozed' weekly with a supposed anti-dote to poisons and twenty five years later was still taking theriac made by a trusted official. She had on her staff a 'lady-taster'. Treacle was imported in 1545 from Flanders at great cost. The Flanders treacle had an import tax of twenty shillings a barrel but a cheaper variety was available from Genoa and taxed at only four pence per pound. No doubt any medical practitioner in army would have used the cheapest available to him.

Each of these two compounds was believed to have properties to overcome poisoning. Their use in the treatment of gunshot wounds would be almost certain as wounds were commonly believed to be poisoned and an antidote with the supposed healing properties of theriac and mithridatium would be almost mandatory.^{2.38}

By the end of the sixteenth century there were about one hundred apothecaries practicing in London. From 1511, during the reign of Henry the Eighth, the Bishop of London licensed some.^{2.39} Later licensing became more formal under an Act introduced by Henry in 1543, 'An Act that persons not being Surgeons may minister outward medicine'.^{2.40} The apothecaries were praised in the same Act for their charitable treatment of the poor and contrasted with the mercenary bearing of the surgeons. They had shopfronts particularly around Bucklersbury near Cheapside.^{2.41} The apothecary's shop could often be recognized by a painted sign often a Turk's head with a gilded pill on his extended tongue. The apothecaries were keen gardeners and botanists and supplied their own herbs but many items were also available from market girls who gathered native herbs in the countryside. Herbs and

healing flowers were collected also by others. In Shakespeare's 'Merry Wives of Windsor', Falstaff states that he is not one of the 'Lisping hawthorn-buds that come like women in men's apparel and smell like Bucklersbury in simple (fresh herbs) time'.^{2.42} There is little doubt that apothecaries acted illegally as laid down by the licensing rules of the day by treating patients and the College of Physicians and the ecclesiastical licensing bodies apprehended many.

It is doubtful if any of the remedies were of therapeutic benefit even if prescribed in the correct manner.^{2.43} It may be that active therapeutic ingredients may have existed in the compounds and mixtures made from the flowers and the herbs that were being prescribed. Thus digitalis comes from the Purple Foxglove, and was recognized in 1542 by Leonard Fuchs 'to scatter the dropsy', an observation that unfortunately was not acted upon until 1775. Squills from the sea onion, extracts from leaves of the flowering Oleander and from the Christmas Rose all contain cardiac glycosides, which could have been dramatic in treating heart failure. The problem presented to the Tudor medical practitioner and to all that prescribe medications is the problem of dosage. Even if the therapeutic benefit from these useful materials was recognized, to give an incorrect dose could be extremely toxic. Perhaps this was the reason that the 'cure-all' mixtures were popular, being prescribed in the homeopathic concept that a little of this or of that is curative but never prescribing enough of anything to be poisonous.

The corm of the Autumn Crocus has an active ingredient, colchicine that is dramatic in relieving the distress of acute gout. Gout was something of a 'catch all diagnosis' in Tudor times, covering the aches of the dreaded syphilis, the pains of rheumatic fever and general joint inflammations. To be able to use colchicine effectively for gout in Tudor times would have placed it in a miracle class for the gout sufferers. However if used in excess colchicine causes most distressing diarrhoea. One bad experience would surely deter the medical practitioner and the fear of further bad experiences would deter further clinical experimentation. How many useful agents were not pursued therapeutically because of the risk of side effects and the inability to recognize a true therapeutic effectiveness? .

The apothecaries did have a range of effective medicines, mostly purgatives of varying severity and the dose of these medicines would have been learnt from experience. The purgatives ranged from the mild fruit laxatives, the more active senna, aloes, wormwood and rhubarb. The very drastic purges were jalup, scammony and colocynth.^{2.44} Co-existing with the apothecaries were those unlicensed persons who were familiar with some knowledge of healing by the use of compounds and herbs, they enjoyed the title of 'empiricks' or 'quacks'.^{2.45}

E. The licensed practitioners. These were selected by application to the appropriate ecclesiastical bodies enabling them to practice medical treatment. The right to practice medicine had been made very easy by an Act of Henry the Eighth that allowed licenses not only to physicians but also all persons 'practicing surgery, physic and barbery'.^{2.46} In 1543, an Act was passed extending privilege further. The Act stated that 'persons not being surgeons may minister outward medicine'. This act in effect gave a status to the previously unlicensed 'healers' should they wish to apply.

F. The unlicensed practitioners. Many of the village practitioners were in effect part of the heterogeneous group who would fall into this category. Whilst many may have a genuine ability to care for the sick or wounded, many would have been of the fairground and wandering soothsayers, magicians and charlatans. In this time however each possibly played a role in attending to the needs of the citizens.

G. The clergy. The church did not lose its interest in the healing arts for Bishops were allowed to take the role of conducting the licensing procedures and then granting` licenses to practice in the larger urban areas. The duty to provide licenses to practice was enforced and from 1512 the Norfolk records show a well-developed ecclesiastical licensing system.^{2.47} The clergy although officially prohibited from undertaking surgery appear to have offered support to the population. To some persons, the most available protection against illness lay in the area of religion. It was preached that 'epidemics were God's punishment for man's sins'.^{2.48} The hope was that the spirit of the church

would prove to be stronger than the spells of the spell-casters. There is no clear indication to what degree the spiritual wellbeing of the troops was attended to in the field. Leicester's army disciplinary code, item 3, outlines the need for attendance at divine service, which was to be read, or preached.^{2.49} A preacher was supposed to be in every company. The Archbishop of Canterbury had caused a prayer for the troops serving in Ireland to be drawn up in 1599. It is likely that similar prayers existed prior to 1585 as with other of Leicester's codes.^{2.50}

In the early part of Elizabeth's reign, warrants for levying surgeons were sent by the Privy Council to the lord mayor of London who passed them to the master of the Company of Barber-Surgeons. As time progressed and the demand for more and more surgeons developed, the Privy Council authorized army captains to find their own surgeons without making any formal application to the Company. In the 1591 Essex expedition to Brittany, twenty captains were given warrants to enlist one surgeon and two drummers each. Essex initially had a force of 3,000 men.^{2.51} The required ratio of 1 practitioner per 100 men could not be reached from the Company.^{2.52} As Cruickshank recorded, by the end of 1590, over 32,000 men had been levied for service abroad and thus recruiting of medical practitioners outside of the Company must have been occurring for quite some time.^{2.53} The captains were required to be responsible for seeing that the medical officer attached to his company carried out his duties satisfactorily. William Clowes, (see chapter 6) the principal surgeon in the army in Flanders, stated that incompetent surgeons were responsible for more deaths among the soldiers than were the enemy. It must also be remembered that the classification by captains of 'medical practitioners' was much wider than Clowes would have accepted. The captains were responsible if the medical force was too small. It was observed that the English surgeons had seen very little active service and were in consequence not very expert in treating gunshot wounds.^{2.54}

It was clear that men could not be expected to serve with any enthusiasm if medical attention, bad or otherwise, was not available. As one captain said

If soldiers saw their fellows dying as a result of slight wounds they would hardly be encouraged to give of their best in battle. But if they knew that speedy and efficient treatment awaited even the slightest hurt their bravery would be multiplied manifold.^{2.55}

It seems curious that the military and political leaders of the time did not follow the lead of the military groups on the Continent by recognizing the value to be achieved by providing adequate permanent medical assistance for the armed forces. Certainly there was no standing army to which the practitioners could be assigned, and the politicians knew that they had the backing of the Barber-Surgeons Company for surgical assistance. This fact may have led to this need being given low priority and being overlooked. The contact with the German mercenaries by the military leaders of the time would surely have caused discussion not only about military tactics but also the condition of the troops. Special regiments of soldiers had been set up in Germany, the Landsknecht, who were raised by Maximilian the First and independent of feudal levies. These elite regiments recognized the need for quick and appropriate medical help if wounded. They paid a Spitalmeister or hospital superintendent to provide medical necessities, (figure 3).^{2.56} They were to be treated by physicians, surgeons and women presumably acting as nurses.^{2.57}

Would the military forces be confident that their well being in health matters would be in competent hands? It is likely that it was a case of their being pleased to have any assistance and the common soldier would be unable to judge competence although 'word of mouth' on a campaign would be sure to have its effects regarding the best available. As most of the levied men in the campaign were recruits from rural areas or the lower society of the cities, they would only expect attention at the level to which they were accustomed.

Instances are recorded that service in the Army could be avoided by bribery of the mustering agents.^{2.58} As outlined previously the available medical manpower would not have been able to provide the expected ratio of



A GROUP OF LANDSKNECHTS

By Victor Solis; second half of sixteenth century.

The engraving shows, from left to right, the piper, drummer, ensign, 'einfacher Landsknecht' or ordinary soldier, 'Doppelsöldner'.

The principal weapon of the Doppelsöldner was the two-handed sword of enormous length. In the armoury at Graz in Austria may be seen a set of helmets and demi-suits of this period for the equipment of the Doppelsöldner of the Imperial army. The ordinary Landsknecht was without armour.

Figure 3 'The Landsknechts' from Schotté, 1587

1 licensed practitioner for 100 troops. Notwithstanding the status of the practitioner, no practitioner could have missed being influenced by the civil disturbances that were occurring in the environment in which they practiced. Although there was little available to the practitioners by written word, the movement of people throughout England and to and from Europe would introduce changes if only by a 'trickle down' effect.

During the reign of Queen Mary, between 1555-1558, a minimum of 287 Protestant men and women were executed following examination ^{2.59} by the Ecclesiastical courts of Mary's Bishops.^{2.60} There was an exodus of people at risk to the continent. About 800 people who had sufficient means had fled to Germany, Switzerland, Italy and France by 1554.^{2.61} Among these were gentry, merchants, clergy, theological and medical students. These refugees were responsible for issuing printed propaganda against Mary.^{2.62} With the accession of Elizabeth to the throne, those religious radicals who had fled for the protection of the German Lutheran princes, commenced to return. These persons must have conveyed gossip about changes on the Continent and sowed seeds to push for better civic conditions.

The mercenaries who had been recruited to serve in England must have known of the relative excellence of the German field surgeons and may have expected similar excellence in England. Certainly if this was so then they may have agitated for better service and passed on this belief to their English companions.

The Protector Somerset hired 7,434 mercenaries from various continental areas. ^{2.63} There were 1,100 German mercenaries who assisted the quelling of the 'Kett revolt' in Norwich in August 1549 during which 3,500 Norwichmen were slaughtered.^{2.64} On the continent when Philip's English army was at the battle of St. Quentin, it included a barbarous German group, the Schwartzrotters (black gangs) who conducted a massacre of the population.^{2.65} The use of mercenaries in conflicts outside their own country of origin was commonplace. Some idea of the available manpower may be quantified

somewhat by noting that Johan Casimir; the Count of the Palatinate led 12,000 mercenaries into Brabant and Flanders in 1578.^{2.66}

It is possible that Philip of Spain may have influenced the English attitudes to military medicine during his time as the husband the Mary Tudor. Philip ruled Spain as Regent from 1551 and subsequently as King following the abdication in October 1555 of his father the celebrated Charles the Fifth. The draft treaties for marriage to Queen Mary Tudor were drawn up by 7 December 1553. Their marriage took place at Winchester Cathedral on 25 July 1554; Philip had arrived in England for the marriage only a week before, accompanied by a household of 3,000 people. It was his custom to be normally protected by a small body of one hundred archers. Philip was the notional King of England from 1554 to 1558 but only during Mary's lifetime. Philip spent the summer of 1554 in England, but he left England for a time in August 1555 to visit the Netherlands. He returned to England on 18 March 1557 and stayed for 5 months before leaving permanently on 6 July 1557.^{2.67}

Mary was said to have attended the Privy Council very infrequently.^{2.68} Her Privy Council was organized under the guidance of William Paget. In the few years of her reign several startling areas of military reorganization occurred in England. It is said that Philip encouraged her to refurbish the Navy.^{2.69} Refurbishing would have been to his advantage as at that time Philip's concern was the French fleet in the English Channel and its actions to blockade the Netherlands. Mary allowed Philip and his courtiers to be aware of business which was being transacted in their joint names.^{2.70} It seems quite possible that Philip's large retinue of attendants would have ample opportunity to put forward other options of military medical assistance based on their Spanish models.

Two Acts to reorganize the militia were passed by Mary's first session of Parliament in 1558. The quasi-feudal system of territorial recruitment was collapsing, probably due to the demise of the old nobility whose role it was previously to gather the forces. The dissolution of the monasteries by Henry, her father, also deprived Mary of considerable revenue as they previously

aided with finances for cavalry. The size of the households of the gentry was smaller possibly because of the effects of inflation and thus each of the households could contribute fewer men. Both Somerset (Edward Seymour) and Northumberland (John Dudley) had found it necessary to recruit foreign mercenaries. There was no true system of national 'musters'. The Acts were said to have emanated from the body of the nobility and the gentry and not directly from the Privy Council, and this may support the idea that the large estates were under financial pressure.^{2.71} The estates were unable to sustain the loss of their key estate workers to the military.

In March 1557, Philip returned from inspecting his estates on the Continent to seek Mary's intervention in a French war. The Privy Council resisted this request only for a month before giving their consent in April 1557. War was declared on 7 June 1557. Philip took a force of 7,221 troops to France under the command of the Earl of Pembroke.^{2.72} They took a minor part in the siege of St. Quentin, a wool-producing center on the Somme, which fell quickly to the Spanish/English forces. Although Philip's campaign was not a great success on land, it suited Philip for the English navy cleared the English Channel and maintained Philip's supply lines to the Netherlands.^{2.73}

There is a suggestion that the first attempt by English forces to have an organized medical force occurred at this siege. There were fifty-seven surgeons to care in particular for the English ordinance.^{2.74} The compassion of Guise at the siege of Metz (see page 138) in 1552 was known to have opened new concepts about the treatment of the sick and the wounded. Central to the benefits to the troops was the well-organized structure of medical assistance. The changes are likely to have been along the lines proclaimed by Maximilian 1 for his Landsknechtes. (See page 155).

England's last toehold in Europe was Calais. The 1,600 man garrison at the Pale of Calais was in command of three strongholds. Ultimately these garrisons at Calais were overwhelmed by 27,000 French who attacked on New Years Day 1558, attacking with amazing audacity across the frozen marshes. Mary had funded the St. Quentin expedition by raising taxes that

also served for the refurbishing of the navy, for ordinances and for fortifications. Mary and Philip apparently decided that Calais was dispensable and persuaded the Privy Council to yield it to which they agreed on the grounds of cost and feasibility of retaking Calais. Mary died in 1558, and Elizabeth was obliged officially to sacrifice Calais in 1559. The English people saw the loss of Calais as a terrible defeat. From the military medical point of view, the practitioners on the force must have faced the problems of a severe winter with which they would have been familiar. However the inadequacies of the English military winter uniform may have caused great hardship to the troops and medically led to chest infections, frostbite and gangrene. The poor clothing for winter was not raised as an issue until the Irish campaigns of the 1600s.^{2.75}

During Mary's rule there was a decision to divide the country into 10 areas under the control of a Lord-Lieutenant who was to perform both police and military duties and to a large degree by-pass the old feudal responsibility of the gentry to provide fighting manpower.^{2.76}

These changes were major ones for England. The Privy Council appears to have submitted quickly to Philip's requests for war and if indeed he was the driving force for the refurbishing of the Navy, he must be regarded as influencing English military policy.

In Spain, the training of physicians and surgeons was a crown responsibility and thus Philip would have been aware of this as Regent of Spain. Did he influence the Barber-Surgeons between 1554-1558? He certainly knew a great deal about the training of medical practitioners in Spain.

In 1555, Cortes in Mexico was approached with the complaint that citizens' lives were in jeopardy because of improperly trained medical personnel.^{2.77} The practitioners produced fraudulent certificates of their degrees that were derived from varying sources. The response in Spain was to introduce regulations that authenticated documents were required to be signed by the

university authorities stating that an apprenticeship of two years with a qualified physician needed to be served. In 1563, Phillip went further, decreed that an Arts Degree from an approved university (Castille, Salamanca, Valladolid or Alcalá) followed by a four year study of medicine as well as the two year apprenticeship was needed. These requirements should be contrasted with the poor state of the physicians and surgeons in England as discussed above.

The Spanish also addressed the training of surgeons in 1551. The overall shortage of surgeons was blamed on the universities for their lack of provision for anatomical dissection. Certainly, Charles the Fifth in 1539 authorized the use of corpses of criminals and bodies from the hospitals to the University of Alcalá. The Company of Barbers-Surgeons did not have this right until 1557, in Philip's time. Some anatomy was also taught at Valladolid in 1550 using corpses. Valencia had a Chair of Surgery in 1502, where the new Vesalian anatomy was taught from 1547. The royal interest in medical matters was shown by Phillip who in 1566 'directed' the University of Salamanca to pay attention to anatomy so that further surgeons could graduate. Due to the loss of surgeons in conflict, many of these desirable regulations had to be put to one side and many licenses to practice were granted to non-university practitioners. Only Italy was more advanced than Spain in training its medical workforce.

Overall, despite the pressure exerted by Philip on the Privy Council to refurbish the navy and his pressure for the military campaign of 1557, it is unlikely but not impossible that he or his attendants could have directly proposed Spanish medical models with any effect in England. The Annals of the Company of Barber-Surgeons do not show any significant contact with Mary and Philip other than for the renewal of their charter. The changes in European military medicine were known to many senior Company members who may have or should have passed on this knowledge.

By the time of Elizabeth it was accepted that there should be a medical presence in the navy and army. The ratio of 1 practitioner to 100 troops had

developed in earlier times and was considered appropriate for a military campaign. The number of practitioners licensed by the ecclesiastics fell far short of the numbers needed for military duty. The Company of the Barber-Surgeons was the main training area for the more formally trained practitioners and were under charter obligations to provide surgeons for the crown when called upon. The bulk of medical services in England and hence in the military was provided by the unlicensed practitioners. These people had in common a professed skill in healing the ill. They were a diverse group and included alchemists, apothecaries, village healers, soothsayers and mystics. The fighting men would have become aware by word of mouth and barrack gossip probably from Continental mercenaries that better medical treatments were available. The pressure 'from below' following the Siege of Metz with its spectacular changes in attitudes towards the wounded and ill probably became a thread that was transmitted to the medical staff.

REFERENCES

- ^{2.1} Young, S. *Annals of the Barber-Surgeons*, (Blades, East & Blades, London, 1890), p.76
- ^{2.2} Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p.118
- ^{2.3} Young, S. *Annals of the Barber-Surgeons*, (Blades, East & Blades, London, 1890), p.259
- ^{2.4} Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p.118
- ^{2.5} Marcus, 'Realm & Castle', *History Today*, Vol.41, Issue 6, June 1991, p.31
- ^{2.6} Young, S. *Annals of the Barber-Surgeons*, (Blades, East & Blades, London, 1890), p.81
- ^{2.7} Ibid, p.77
- ^{2.8} Ibid, p.101
- ^{2.9} Ibid, p.102
- ^{2.10} Guy, John. *Tudor England*, (Oxford University Press, Oxford, 1988), p.190
- ^{2.11} Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p.118
- ^{2.12} Pelling, M. and Webster, C. 'Medical Practitioners', *Health, Medicine and Mortality in the Sixteenth Century*, (Cambridge University Press, Cambridge, 1979), p.183
- ^{2.13} Ibid. p.225
- ^{2.14} Singer, Charles, 'Medicine in the Reign of Elizabeth 1st', *The Medical Annual*, (John Wright, London, 1953) p.18
- ^{2.15} Pelling, M. and Webster, C. 'Medical Practitioners', *Health, Medicine and Mortality in the Sixteenth Century*, (Cambridge University Press, Cambridge, 1979), p.188
- ^{2.16} Copeman, W.S.C. *Doctors and Disease in Tudor Times*, (Dawsons of Pall Mall, London, 1960), p.37
- ^{2.17} Paré, A. *The Works of Ambroise Parey [Paré]*, (Cornhill, London. 1611).
- ^{2.18} Slack, P. 'Mortality Crises and Epidemics, 1485-1610' *Health, Medicine and Mortality in the Sixteenth Century* (Cambridge University Press, Cambridge, 1979.) p.31
- ^{2.19} Ibid.p.45
- ^{2.20} Schot, John. *A True Relation*. Translation, Sir James William, 1587, ed. Samuel Scott, (John Johnson, Oxford University Press, Oxford. 1929).
- ^{2.21} Ibid.
- ^{2.22} Gale, Thomas *Certain Works of Chirurgerie*. Amsterdam, 1563.
- ^{2.23} Pelling, M. and Webster, C. 'Medical Practitioners', *Health, Medicine and Mortality in the Sixteenth Century*, (Cambridge University Press, Cambridge, 1979), p.187

- 2.24 Cruickshank, C.G. 'Elizabeth's Army' Oxford University Press, London, 1946). p. 112
- 2.25 Ibid. p.146
- 2.26 Pelling, M and Webster, C. 'Medical Practitioners' *Health, Medicine and Mortality in the Sixteenth Century*, (Cambridge University Press, Cambridge, 1979). p. 189
- 2.27 Ibid, p.189
- 2.28 Ibid, p.168
- 2.29 Ibid, p.169
- 2.30 Garrison, Fielding, H. *An Introduction to the History of Medicine*, (4th.Ed. W.B.Saunders, Philadelphia,1929) p. 235
- 2.31 Young , S. *Annals of the Barber-Surgeons*, (Blades, East & Blades,London,1890), p.321
- 2.32 *Acts of The Privy Council*, New Series,16:11 1588 (H.M. Stationary Office,1897).
- 2.33 Young , S. *Annals of the Barber-Surgeons*, (Blades, East & Blades,London,1890), p.318
- 2.34 Wilson, Derek. *Sweet Robin*, (Hamish Hamilton, London 1981), p.69
- 2.35 Singer, Charles, 'Medicine in the Reign of Elizabeth 1st', *The Medical Annual*, (John Wright, London, 1953) p.18
- 2.36 Watson, G. 'Theriac and Mithriadatium: A Study in Therapeutics', (The Wellcome Historical Library, London, 1966), p.111
- 2.37 Ibid, p.111
- 2.38 Gabriel,R.A and Metz,K.S. *A History of Military Medicine*, (Greenwood Press, NewYork.1992), p.66
- 2.39 Copeman, W.S.C. *Doctors and Disease in Tudor Times*, (Dawsons of Pall Mall, London, 1960), p.44
- 2.40 Singer, Charles, 'Medicine in the Reign of Elizabeth 1st', *The Medical Annual*, (John Wright, London, 1953) p.11-12.
- 2.41 Pelling, M. and Webster, C. 'Medical Practitioners', *Health, Medicine and Mortality in the Sixteenth Century*. (Cambridge University Press, Cambridge,1979) p.178.
- 2.42 Shakespeare, W. *The Merry Wives of Windsor*, Act III, Scene 3.
- 2.43 Slack, P. 'Mortality Crises and Epidemics, 1485-1610', *Health, Medicine and Mortality in the Sixteenth Century*. (Cambridge University Press, Cambridge, 1979). p.264
- 2.44 Copeman, W.S.C. *Doctors and Disease in Tudor Times*, (Dawsons of Pall Mall, London, 1960), p.142
- 2.45 Ibid, p.55
- 2.46 Young, S. *Annals of the Barber-Surgeons*, (Blades, East & Blades, London, 1890), p.72
- 2.47 Pelling, M. and Webster, C. 'Medical Practitioners', *Health, Medicine and Mortality in the Sixteenth Century*, (Cambridge University Press, Cambridge, 1979), p.10
- 2.48 Slack, P. 'Mortality Crises and Epidemics, 1485 -1610' *Health, Medicine and Mortality in the Sixteenth Century* (Cambridge University Press, Cambridge,1979), p.10
- 2.49 Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p.141
- 2.50 Ibid, p.140
- 2.51 Guy, John. *Tudor England*, (Oxford University Press, Oxford, 1988), p.344
- 2.52 Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p.120
- 2.53 Ibid, p.137
- 2.54 Ibid, p.120
- 2.55 Ibid, p.125
- 2.56 Heizmann, Charles L. ' Military Sanitation in the Sixteenth, Seventeenth and Eighteenth Centuries', *Annals of Medical History*, (Paul Hoeber, New York, 1917). Fall issue,1:281
- 2.57 Schot, John. *A True Relation*. Translation, Sir James William, 1587, ed. Samuel Scott, (John Johnson, Oxford University Press, Oxford. 1929).
- 2.58 Motley, J.L. *The United Netherlands*, John Murray, London, 1869, p. 393.
- 2.59 Guy, John. *Tudor England*, (Oxford University Press, Oxford,1988), p.238
- 2.60 Wilson, Derek. *Sweet Robin*, (Hamish Hamilton, London 1981), p.76
- 2.61 Ibid. p.76
- 2.62 Guy, John. *Tudor England*, (Oxford University Press, Oxford 1988), p.238
- 2.63 Ibid. p.202
- 2.64 Wilson, Derek. *Sweet Robin*, (Hamish Hamilton, London 1981), p.36
- 2.65 Ibid. p.75
- 2.66 Schmidt, Benjamin, *The Dutch Imagination and the New World, 1570-1670*, (Cambridge University Press, Cambridge, 2001). p.101
- 2.67 *Oxford Dictionary of National Biography*, (Oxford University Press, Oxford, 2004) 44.14-22

- ^{2.68} Guy, John. *Tudor England*, (Oxford University Press, 1988), p.247
- ^{2.69} Ibid. p.238
- ^{2.70} *Oxford Dictionary of National Biography*, (Oxford University Press, Oxford, 2004) 44.14-22
- ^{2.71} Guy, John. *Tudor England*, (Oxford University Press, Oxford, 1988), p.245
- ^{2.72} Ibid.p.248
- ^{2.73} Ibid.p.248
- ^{2.74} Heizmann, Charles L. 'Military Sanitation in the Sixteenth, Seventieth and Eighteenth Centuries', *Annals of Medical History*, (*Annals of Medical History*, (Paul Hoeber, New York, New York, 1917). Fall issue, 1:284 also Garrison, Fielding, H. *An Introduction to the History of Medicine*, (W.B.Saunders, Philadelphia, 1929.) 4th Ed. p.65, quoting Taylor, A. 'A Retrospective of Naval and Military Medicine', p.317
- ^{2.75} Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p.73
- ^{2.76} Guy, John. *Tudor England*, (Oxford University Press, Oxford, 1988), p.247
- ^{2.77} Goodman, D. *Power and Penury*, *Spanish Studies*, (Cambridge University Press, Cambridge, 1988) p.215

CHAPTER 3

THE REVOLUTION IN MEDICAL TEACHING

England could be regarded as a backwater in the area of medical learning during the fifteenth and sixteenth centuries.^{3.1} On the Continent of Europe changes were occurring in the medical faculties with glimmerings of scientific method being taught along with the classical semi-philosophical teachings of Hippocrates (426-350 B.C.) and of Galen (129-216). Galen was the most influential writer basing his theories upon the 'humours and spirits of the body'. The application of his theories formed the basis of the rationale of his therapeutics, which was required study for medical students. He taught that a breach in the precarious balance of the humours within an individual produced 'putrefaction' and 'corruption' and hence disease. The balance could be broken as much by circumstances as by physical excesses showing an understanding of the role that psychological factors could be involved in causing disease.^{3.2} His knowledge of herbs and healing items and their use was studied by his students. His teachings were considered rational as opposed to many of the magically oriented medical beliefs. Notwithstanding the advances in practical surgery and therapeutics, God always remained the first arbitrator in human afflictions.

The few English physicians who wished to study the advanced medicine of their time in the sixteenth century were compelled to study on the Continent. The advanced medical centres were at Paris, Montpellier, Bologna and Padua. The English usually attended the University of Padua, nominally a Catholic University, which was regarded as the foremost medical school of its time and had the added attraction for the English of not imposing religious sanctions upon its students and in the granting of degrees. There was by the mid 1550s a major change in study patterns for students to include the progressive Basel University in Switzerland deep in the heartland of the Reformation movement. Later in the 1580s the Protestant University at Leyden was favoured also by the English students. John James, who was later to be a physician to Leicester and Philip Sidney, was in 1578 the first

medical student and in 1581 he was the second to obtain a medical degree from Leyden.^{3.3} He had previously completed a medical degree at Cambridge.

Andreas Vesalius (1514-1564) at the University of Bologna commenced a scholastic approach to anatomy and dissection of the human body. Professor da Monte was appointed the first Professor of Practice at Padua in about 1539. He revolutionized progress in medical training by introducing bedside teaching and he utilized the nearness of the Hospital of St. Francis to undertake daily hospital rounds. He taught systematic teaching of the 'urines' and the 'pulses' and thus formally initiated the 'laying on of hands' within a medical examination. There were autopsies of fatal cases that from the point of view of teaching would have been invaluable by showing the diseased tissue and comparing this to normal tissue. The surgeons would have seen beneath the skin the anatomical structures that previously they might have seen only in anatomy drawings. The governing Venetian Senate did not officially sanction practical bedside teaching until 1578.

The period from 1530 to 1560 represented the time when the classical teaching of medicine underwent its major changes in the reformation mode, and the revolution of medicine blossomed. The classical core of medical theories was to be shaken and shocked by the suggestions and attitudes that were taught in Basel. Among the first to question the wisdom of conventional medical teaching was Phillipus Aureolus Paracelsus (1493-1541) (also known as Theophractus Paracelsus of Hohenheim). His concepts attracted medical students to learn from his vigorous teaching. He came to Basel in the spring of 1527 where he obtained the post of city-physician.^{3.4}

Paracelsus dismissed with contempt much of the accepted teaching of medical philosophy and theology. He spoke of Galen as representing a relic of the decaying pagans of the Roman Mediterranean culture.^{3.5} His radical dismissal of classical teaching outraged many of his fellow physicians in Basel as he made statements such as 'we will purge medicine of its gravest errors, because we are not dedicated to the precepts of the ancients'.^{3.6} Galen taught of the influence of astrology, star-signs and 'spirits' influencing the body

responses resulting in illness but he did also investigate the properties of herbs and plants. Paracelsus required that physicians needed to recognize the signs of intrinsic qualities from the external appearance of natural objects. This teaching of recognition equates in human sickness to clinical observations of a patient's appearance a fundamental for good clinical practice.^{3.7} Anatomy, bedside teaching and the therapeutic value of plant extracts were coming together in the teaching curriculum of a medical practitioner.

Paracelsus taught that there was a need to investigate in depth animal and plant structures and to look at the minerals for their therapeutic powers. The emerging study of alchemy that included the art of distillation caused many more oils and concentrated liquids to be available. The ability to change substances by chemical means soon caused the application of the resulting compounds to medical matters and could often be seen as like 'magic' in the absence of knowledge of chemistry. Paracelsus was an avid experimenter in alchemy. In particular he used, and taught about, the medicinal properties of antimony.^{3.8} He also introduced the use of opium, mercury, iron, arsenic and copper sulphate into therapeutics.^{3.9} It may be speculated how many deaths as well as 'cures' resulted from these medicines; however the shift to experiment with chemicals represents a milestone in therapeutics and the glimmerings of science. The failure to recognize the toxicity level of mercury was to be a great drawback in its undoubted therapeutic properties in the treatment of syphilis.^{3.10} At last the medical practitioners had a substance which worked to overcome the terrible disease. What quantity to use and by which method of administration were questions that remained unanswered for a further three centuries.

Paracelsus required that his students should be able to recognize herbs. He commenced a herbarium that became so developed by others that in 1580, a *hypocaustra* or hothouse had been constructed to grow plants during the savage winters.^{3.11} Paracelsus introduced the use of mineral baths and he also wrote a book on mental disease.^{3.12} Paracelsus was required to move from Basel after only one year in office but taught in other parts of Europe. It

is not clear from William Clowes' military texts if Clowes recognized the mentally ill other than by the general term of 'mad' persons.^{3.13} Clowes followed Paracelsian teaching during his career but where he obtained his understanding is not clear. There is no evidence that he studied with Paracelsus, it must be assumed that he obtained Continental texts.^{3.14}

Paracelsus wrote in the vernacular and in a manner that was easy to understand. This style appealed to a wide readership and was basically in keeping with the questioning of dogma in the Reformation. English and other physicians in Europe were soon to become familiar with the concepts espoused by him, probably by word of mouth for although Paracelsus wrote copiously, his works had limited circulation particularly in England. In 1470 Basel had two printers and eighteen by mid sixteenth century, whereas Montpellier University did not have a press until 1590.^{3.15} A lack of texts remained a formidable hurdle to teaching new concepts until the late sixteenth century.

Paracelsus had a strange personality described as truculent and a bully who browbeat his colleagues. On the other hand, it seems clear that he was an observant physician who recognized that endemic goiter and cretinism had a common background, indicating probable cause and effect. He also described various miner's diseases and diagnosed that exposure to chokedamp (probably methane gas) that could result in death.

Some of the students studying in Europe were members of the Barber-Surgeons Company and may subsequently have been core teachers in the Company. As the Company required that those seeking admission had to attend lectures, take part in the demonstrations of anatomy and satisfy examiners of their proficiency, there would have been many opportunities to discuss progress and to share ideas. The student physicians and surgeons who had studied in Europe would have passed on new messages to those around them. In turn by a 'trickle down' effect the new ideas would enter the thoughts of the apothecaries and both licensed and unlicensed practitioners. It

is very likely that many of these practitioners were to make up part of the medical practitioners in the military forces.

The radical stance of Paracelsus caused him to move from Basel after only one year in office due to clashes with the more conservative teachers. He practiced in numerous areas subsequently. His ideas continued to be taught by Theodor Zwinger and his son Jacob, along with Leonhard Thurneisser zum Thurn, an alchemist, and they continued to attract many students to Basel up to forty years later after his death in 1541.^{3.16}

A further giant leap in learning occurred when Fuchs published his momentous text of illustrated botanical specimens from Basel in 1542, which allowed scholars to identify the medicinal herbs with some certainty. Paracelsus understood that there was little purpose in describing medicinal value in various compounds if his students could not recognize the herb or mineral. There was great activity among the cultivators of herbs across Europe but verbal descriptions fell far short of the value of illustrations. Herbals of great beauty were published during the late 1500's. John Gerard, of the Barber-Surgeons Company, published in 1597 'The Herball or Generall History of Plantes' a folio of 1400 pages with 1800 illustrations of plants.^{3.17} This work must have taken many years to be researched sufficiently to be published in such a large collection.

It is possible that the influence of Paracelsus caused the medical faculty at Montpellier to recognize the desirability of testing compounds on 'dumb animals' in order to determine the strength of the medicines they were dispensing.^{3.18} If this was in the minds of the faculty then it would be a major step in therapeutics and if the experiments were properly conducted and the conclusions implemented by the students on their return to their own countries rational therapeutics would have a true basis of scientific method.

Only two books on alchemy were available in English prior to 1600^{3.19} but knowledge of the ideas were widespread in England. Books by Paracelsus were published in Latin in Europe from 1560 onwards but were not available

in England where only collections of extracts of his recipes were found and usually in private libraries. Only two books by Paracelsus were available in English prior to 1640. Nevertheless his work was widely known and his ideas employed widely in particular by the lower ranks of medical practitioners. His changed concepts were adapted in the wider sense by accepting that practitioners could use new modes of treatment and the use of 'secret remedies' became widespread. He experimented with alcohol extraction and thus introduced the use of laudanum, which was derived from opium. Laudanum became the stock painkiller for the next three centuries.^{3.20} There were many that believed that within the study of alchemy lay the secret of the 'elixir of life'. In 1540, Roger Bacon made many references during his alchemy papers to a 'secret secretorum' about which he inferred his knowledge was derived from the writings of Aristotle^{3.21}. Sir Hugh Plat supported a notion of Roger Bacon 'that man's life could be greatly extended'^{3.22}

There was open support of the unlicensed practitioner in England by many of the aristocracy and gentry.^{3.23} Throughout England literacy was improving.^{3.24} No longer was learning confined to the nobles and the families of the extremely privileged, persons were 'not ignorant', and increasingly literate. Tradespeople, yeomen and some country gentlemen read the almanacs, as would the apothecaries.^{3.25} On the Continent the value of unlicensed surgeons was appreciated early in the sixteenth century as Europe had been the site of many bloody battles. As in England, many of the surgeons probably were of 'low birth' and many were probably 'common cutters'. They had no formal education and were not inhibited by theories, learning their trade on the battlefield often with distinction. Many became very distinguished and some were admitted to the Paris Faculty in 1506 to lecture and train other surgeons.^{3.26} Ambroise Paré, the famous French surgeon was an unlicensed medical practitioner in his early army career^{3.27}

By mid sixteenth century the alchemy teachings of Paracelsus had commenced to spread far afield, and perhaps added to the endeavors of those who were already involved in alchemy study. By the late 1500s alchemy probably dominated medical thinking in Europe. The University dons, Zwinger

at Basel, Hartman at Marburg, and the Royal Physicians Duchene in France and Severinus in Denmark taught his methods. The physicians who had studied in the European milieu carried the ideas back to England.

Alchemy was immensely popular and practiced by medical and lay persons of all ranks. In England, licenses were required to practice alchemy and were granted as early as the reign of Henry the Sixth. In Elizabeth's time high priority was given to the importation of 'foreign chemists and mineral masters'^{3.28}. This was an attempt to stimulate the economy and to exploit the deposits of salts, iron, copper, tin, lead and the precious metals gold and silver. It was recognized that England was lagging behind in these skills and that raw materials were needed for cannon manufacture. The success may be judged by the setting up in 1568 of the Society of Minerals and Battery Works and the Commonality for the Mines Royal.^{3.29}

The mix of persons involved in the general teaching and instruction of the medical practitioners included many members of the clergy. With pronounced change in religious philosophy under Mary Tudor, many clerics chose to flee to the Continent. Among these were William Turner, the Dean of Wells and a convinced Protestant. He furthered his contact with foreign medical students and published herbals and 'A New Book on Medicinal Springs' in 1555. This interest suggests that he had contact with Paracelsus or his students.

The relationship between the various medical practitioners and the clergy was overlapping, prompting Caius to disclaim any intention to trespass on the area of the 'devines'. There were at least twenty-seven devotional works for the sick before 1605, mostly but not exclusively prayers and meditation. There were also books on 'ghostly medicines', 'godly gardens' of herbs, and 'pomanders of prayer'. The power of spirit healing and magic was deeply part of the popular psyche.^{3.30} The acceptance of the healing powers of prayer among the general populace is demonstrated by the treatment which was given to Margaret Neale of Aldeburgh in 1597. The church authorities in their role of custodians of the public health of Norfolk recorded that she used a prayer to God, and then the paternoster, the creed and another prayer and

before this she used to wash. She was ordered to do penance in the church, bearing a placard inscribed 'for witchcraft and enchantment' in capital letters and carrying a white wand.^{3.31} It would appear to be punishment beyond the crime and suggests that all her misdemeanors were not recorded. However the role of magic in healing would be readily accepted by the troops as an every day part of the healing and tending role.

Books remained in short supply and many were found only in the libraries of noble families and thus remained in elitist hands. Of 153 medical titles available prior to 1605, about 30% were translations of foreign works. Progress in medical medicine was inhibited by the lack of books on the subject. Of the books available in 1585 only four had application to English military medicine, namely those written by William Clowes, Thomas Gale, John Banister and Peter Lowe.^{3.32} Thomas Gale (1507-1587) was a surgeon at one time in the army of Henry the Eighth, notably at the siege of Montreuil in 1544. He published in 1563 'Certain Works of Chirurgerie'. He was then sergeant-surgeon to Elizabeth. He had been influenced by the teachings of Paracelsus for he advocated arsenic be an ingredient in a formula for a styptic powder he had formulated. Like Clowes, he too, deplored the inferior nature of the men employed as surgeons at Montreuil and described them as sowgelders, tinkers and cobblers.^{3.33}

Charles L. Heizmann states that there were forty-five works or parts of works from all sources on the subject of military surgery published by barber-surgeons and one on military pharmacy, one on military hygiene and eleven on various diseases associated with military service.^{3.34} These items were mostly published after Paré's first publication in 1545. He could find only one treatise specifically on hygiene in the 16th Century by Anton Schneeberger 'De bona militum valetudine conservanda, 1564' and a chapter in a surgical work by N. Godin, 1558.

John Banister served as a surgeon in the Le Havre expedition where he met the young William Clowes. John Banister was a leading surgeon and lectured for the Barber-Surgeons but the College of Physicians prosecuted

him not withstanding his surgical prominence for practicing as a physician.^{3.35} He may have been singled out by the College for advocating Paracelsianism, at this time when the College of Physicians disapproved of the concepts.^{3.36}

Peter Lowe, a Scotsman, had a strange role in military medicine, as he was chirurgion-major to a Spanish Regiment in Paris towards the end of the 16th Century. His specialty was rapid amputations of the digits by mallet and chisel. On his retirement from army services he founded the Glasgow medical school.^{3.37} He does not appear in the record of the annals of the Barber-Surgeons Company.

The College of Physicians initially attacked the Paracelsian movement and outlawed its members from practicing his ideas. The prohibition flowed to the Surgeons who were subservient to the College in policy matters. The Barber-Surgeons' Company owed much of its rise in prestige to its co-operation with the College of Physicians.^{3.38} Ultimately the College's attempt to prohibit the use of alchemy failed and in 1601 the College allowed its fellows to practice alchemy. The surgeons had drifted towards Paracelsus unofficially from 1570-1590, possibly influenced by John Banister and the remarkable and widely celebrated surgeon William Clowes who became an ardent advocate for Paracelsus late in his career.^{3.39} It must be supposed that the discussions within the Company of the value of the new approaches advocated by Paracelsus had more to offer to practical surgeons than the humanistic attitudes of the College of Physicians. Clowes should have carried Paracelsian practices into his military activities but there is nothing to support this in his military writings other than the use of mercury in syphilis. Many small handbooks commenced to appear in English, the first apparently being Francis Cox's 'Treatise of the making and use of divers, Oils, Unguents, Emplasters and Distilled Waters'. This appears to have been approved by the College of Physicians and subsequently there were other publications by 'chemical' practitioners.^{3.40} Certainly William Clowes in his text 'Prooved practice for all young chiruigians, concerning burnings with gunpowder' (1591) devoted 10% of the book to lues (syphilis). He was aware of the therapeutic use of mercury that had been employed in therapy for the treatment of syphilis

since the late fifteenth century.^{3.41} The Arab physicians, Avicenna, Rhazes, Mesue and others had introduced mercury for therapy against skin complaints.^{3.42}

About this time too accusations of 'witchcraft' became very prevalent particularly in the rural areas. The unlicensed practitioners were very often subject to public resentment and harried by the ecclesiastical authorities that were attempting to encourage all practitioners of healing to be licenced.^{3.43} These practitioners would have carried their skills into the military if conscripted for service but their services would have been welcomed by the troops and familiar to them as they would have been at home.

These publications opened the way for genuine publications in English of the works of Paracelsus including 'The Key to Philosophy' by John Hester in 1580. The new learning from the Continent was slow to be adopted by the Barber-Surgeons and by the College of Physicians. These two bodies existed in peaceful state and politically it was safer to remain with Galen's teachings. The Surgeons however slowly moved towards Paracelsianism between 1570 and 1590. The questioning of older beliefs commenced to leap ahead among unlicensed practitioners who embraced Paracelsianism and the use of 'empirics' although this teaching was very much against the interest and authority of the College. The reformation of medical thinking was well underway from 1575 onwards and thus by osmosis was likely to be practiced by the military practitioners. Its slow progress is mirrored by the fact that there were only two books by Paracelsus in English prior to 1640 as noted previously. Shakespeare writing in 1603 and 1604 had recognized the penetration into the common realm of the feud between the Galenists and the Paracelsians, in 'All's Well That Ends Well' Act 2, Scene 3, lines 1-17. It is thought that his remarks reflect a prevailing view that the followers of Galen tended to pronounce difficult diseases incurable whereas the Paracelsians were 'philosophical persons' who made modern things that were supernatural and causeless and thus making 'trifles of terrors'.^{3.44}

Lafeu They say miracles are past; and we have our philosophical persons, to
 Make modern and familiar, things supernatural and causeless. Hence is it
 that we make trifles of terrors, ensconcing ourselves into seeming
 knowledge, when we should submit ourselves to an unknown fear.

Parolles Why 't is the rarest argument of wonder that hath shot out in our latter
 times.

Bertram. And so 't is.

Lafeu. To be relinquished of the artists,—

Parolles. So I say.

Lafeu. Both of Galen and Paracelsus.

Parolles. So I say.

Lafeu. Of all the learned and authentic fellows,—

Parolles. Right; so I say.

Lafeu. That gave him out incurable.

Parolles. Why, there 't is; so say I too.

English physicians mainly trained abroad in the time of Henry the Eighth. Only one physician, Thomas Linacre (1460-1525), became an exponent for the need for advanced training centres in his own country and thus avoid the need to go to the Continent. He had studied in both Bologna and Padua and spent thirteen years in Italy. He was a physician to Henry the Eighth and assisted in founding the College of Physicians in 1518.^{3,45} His efforts were not particularly successful, as he was a man of learning rather than a scientific investigator. He had the Chair of Philosophy at Oxford and his main contributions to medicine were by the translation of medical texts from Greek.

The universities failed badly in medicine tuition, as they did not follow the Continental leads. Neither Oxford nor Cambridge provided anatomical dissection. John Caius, one of the foremost English anatomists failed to sway the universities but he did give anatomy lectures to the Barber-Surgeons in 1544. He was the second founder of Gonville and the founder of Caius College at Cambridge. He was President of the College of Physicians in 1555. Notwithstanding his influence in many areas, he was mainly ineffectual in promoting wider university involvement in medical studies. He too had studied at Bologna and later Flanders.

Progressive education of the Barber-Surgeons was mainly given within the Company itself. Thomas Vickary, the Sergeant-Surgeon of the Barber-Surgeon's Company wrote in 1548 the first anatomy text in English 'The Englishman's Treasure'.

It was not until 1565, that Elizabeth the First allowed the Royal College of Physicians to dissect human bodies on its premises, twenty-six years after Da Monte in Padua. The Fellows of the College, under a threat of a fine for refusal, were required to give demonstrations and anatomy lectures. The number of qualified physicians at the time of Elizabeth was pitifully small, the fellowship was restricted to twenty as well as the Royal Physicians, and thus the numbers spread throughout England was small compared to the population. There were few towns large enough to support a physician and certainly no scope for medical schools.

However, improved medical education was slowly penetrating into England because of the increased availability of texts as the numbers of printing presses increased. Some of the classical texts were being printed in English. What could be classed as a medical text might involve religion, astrology, herbals, and possibly magic. Without doubt non-medical people were reading more widely with the greater availability of books. Thus Shakespeare is thought to have learnt about melancholy from Bright's treatise on melancholy published in 1586.^{3.46} With some selection, Slack believes that possibly 153 medical titles were published up to 1605.^{3.47}

Herbals were popular in Elizabeth's time and dealt with early botanical science but contained very little practical medical advice.^{3.48} The medical uses of herbs did appear on the Continent as pharmacopoeias but not in England. The College of Physicians decided to publish one in 1585 but did not proceed until 1589 and it was not printed until 1618.^{3.49}

Advances in medical education and practice were almost at a standstill in the early Elizabethan times. However on the Continent there were many new approaches developing particularly in chemistry and botany. The enthusiastic

physician or surgeon in England was required to study overseas to widen his knowledge. Italy was at first attractive particularly for the study of advances in anatomy. In Switzerland Paracelsus was teaching dramatic changes in alchemy and therapeutics and even early concepts of clinical trials were being utilized. The changes in medical theory and philosophies were rapidly changing on the Continent but mainly were conveyed to England by word of mouth. Books and texts were appearing in England but were few in number and had limited distribution and as a means for influencing any widespread approaches to change by the general body of practitioners probably played a very small role.

REFERENCES

- 3.1 Pelling, M and Webster, C. 'Medical Practitioners', *Health, Medicine and Mortality in the Sixteenth Century*, (Cambridge University Press, Cambridge, 1979) p.165
- 3.2 Slack, P. 'Mortality Crises and Epidemics, 1485-1610', in Webster, C. 'Health, Medicine and Mortality in the Sixteenth Century' (Cambridge University Press, Cambridge, 1979). p. 268
- 3.3 Pelling, M. and Webster, C. 'Medical Practitioners', *Health, Medicine and Mortality in the Sixteenth Century*, (Cambridge University Press, Cambridge, 1979), p. 190
- 3.4 Reed, Karen. *Botany in Medieval and Renaissance Universities*, (Garland Publishing, London, 1991). p. 99
- 3.5 Webster, Charles. 'Alchemical and Paracelsian Medicine', *Health, Medicine and Mortality in the Sixteenth Century*, (Cambridge University Press, Cambridge, 1979). p. 316
- 3.6 Reed, Karen. *Botany in Medieval and Renaissance Universities*, (Garland Publishing, London, 1991). p. 100
- 3.7 Ibid, p.101
- 3.8 [www.reference.com/ battle of Cerignola](http://www.reference.com/battle_of_Cerignola).
- 3.9 Longman's. *Illustrated Encyclopaedia of World History, 1976*, (Peerage Books, Avon, England, 1985)
- 3.10 Reed, C. S. 'The Codpiece: Social Fashion or Medical Need?' *Internal Medical Journal*, (Blackwell Publishing, Melbourne, 2004). 34:684-686.
- 3.11 Reed, Karen. *Botany in Medieval and Renaissance Universities*, (Garland Publishing, London, 1991). p. 106
- 3.12 Longman's. *Illustrated Encyclopaedia of World History, 1976*, (Peerage Books, Avon, England), 1985
- 3.13 Clowes, W. *Prooved Practice for All Young Chirugians, Concerning Burnings With Gunpowder*, London, 1591.
- 3.14 Ibid.
- 3.15 Reed, Karen. *Botany in Medieval and Renaissance Universities*, (Garland Publishing, London, 1991), p.94
- 3.16 Ibid, p.137 & p.103
- 3.17 Young, S. *Annals of the Barber-Surgeons*, (Blades, East & Blades, London, 1890), p.541.
- 3.18 Reed Karen. *Botany in Medieval and Renaissance Universities*, (Garland Publishing, London, 1991). p. 45
- 3.19 Webster, Charles. 'Alchemical and Paracelsian Medicine', *Health, Medicine and Mortality in the Sixteenth Century*, (Cambridge University Press, Cambridge, 1979). p. 308
- 3.20 Garrison, Fielding, H. *An Introduction to the History of Medicine*, (W.B.Saunders, Philadelphia, 1929. 4th Ed.) p.204

- 3.21 Webster, Charles. 'Alchemical and Paracelsian Medicine', *Health, Medicine and Mortality in the Sixteenth Century*, (Cambridge University Press, Cambridge, 1979). p. 308
- 3.22 Ibid p.309
- 3.23 Ibid p.328
- 3.24 Slack, P. 'Mirrors of Health and Treasures of Poor Men: the uses of the Vernacular Medical Literature of Tudor England', *Health, Medicine and Mortality in the Sixteenth Century*, (Cambridge University Press. Cambridge, 1979), p.237
- 3.25 Slack, P. 'Mortality Crises and Epidemics, 1485-1610', *Health, Medicine and Mortality in the Sixteenth Century*, (Cambridge University Press, Cambridge, 1979). p. 258
- 3.26 Gabriel, R.A.and Metz, K. S. *A History of Military Medicine*, (Greenwood Press, New York, 1992). p.52
- 3.27 Parker, George. *The Early History of Surgery in Great Britain*, (A. & C. Black, London, 1920). Preface.xi
- 3.28 Webster, Charles. 'Alchemical and Paracelsian Medicine', *Health, Medicine and Mortality in the Sixteenth Century*, (Cambridge University Press, Cambridge, 1979), p.303
- 3.29 Ibid, p.303
- 3.30 Slack, P. 'Mortality Crises and Epidemics, 1485-1610', *Health, Medicine and Mortality in the Sixteenth Century*, (Cambridge University Press, Cambridge, 1979) pps. 254/5
- 3.31 Pelling, M. and Webster, C. 'Medical Practitioners' in *Health, Medicine and Mortality in the Sixteenth Century*, (Cambridge University Press, Cambridge, 1979), p. 188
- 3.32 Ibid.p.253
- 3.33 Laffin John. 'Surgeons in the Field' (J.M.Dent & Sons, London, 1970) p.32
- 3.34 Heizmann, Charles, L. 'Military Sanitation in the Sixteenth, Seventeenth and Eighteenth Centuries.' *Annals of Medical History*, (Paul Hoeber, New York, 1917). Fall issue, 1:282
- 3.35 Pelling, M. and Webster, C. 'Medical Practitioners' in *Health, Medicine and Mortality in the Sixteenth Century*, (Cambridge University Press, Cambridge, 1979), p.185
- 3.36 Webster, Charles. 'Alchemical and Paracelsian Medicine', *Health, Medicine and Mortality in the Sixteenth Century*, (Cambridge University Press, Cambridge, 1979), p.328
- 3.37 Laffin John 'Surgeons in the Field' (J.M.Dent & Sons, London, 1970).p.33
- 3.38 Webster, Charles. 'Alchemical and Paracelsian Medicine', *Health, Medicine and Mortality in the Sixteenth Century*, (Cambridge University Press, Cambridge, 1979), p.327
- 3.39 Ibid p.305
- 3.40 Ibid, p.321
- 3.41 Clowes, W. *Prooved Practice for All Young Chirugians, Concerning Burnings With Gunpowder*, London, 1591.
- 3.42 Lancereaux, E. A. *Treatise on Syphilis*, (New Sydenham Society, London, 1868), 2:291
- 3.43 Slack, P. 'Mortality Crises and Epidemics, 1485 -1610', *Health, Medicine and Mortality in the Sixteenth Century*, (Cambridge University Press, Cambridge, 1979), p. 234
- 3.44 Shakespeare, W. 'All's Well That Ends Well' Act 2, Scene 3, lines 1-17.
- 3.45 Black, J. B., *The Reign of Elizabeth, 1558-1603*, (Oxford University Press, Oxford, 1994), p. 330.
- 3.46 Garrison, Fielding, H. *An Introduction to the History of Medicine*, (W.B Saunders, Philadelphia, 1929) 4th. Ed. p.203.
- 3.47 Slack, P. 'Mortality Crises and Epidemics, 1485-1610', *Health, Medicine and Mortality in the Sixteenth Century*, (Cambridge University Press, Cambridge, 1979), p. 238
- 3.48 Singer, Charles, 'Medicine in the Reign of Elizabeth 1st', *The Medical Annual*, 1953, (John Wright, London, 1953) p.18
- 3.49 Ibid.p.18

CHAPTER 4

THE MEDICAL EXPECTATIONS OF THE MILITARY COMMANDERS IN FLANDERS

Conducting a war in the Elizabethan period was very complicated and semi-feudal in its administration. Elizabeth's Privy Council, composed by as many as twenty persons who varied from time to time guided her. It was the Privy Council who appointed or delegated tasks to subordinates in order to carry out the Queen's commands and the Council was the main executive body. A key figure within the Council was Elizabeth's Private Secretary and advisor, a post occupied by William Cecil, Lord Burghley from 1558 to 1572, after which he was Lord Treasurer from 1572 until his death in 1598. From 1573 to 1590, Sir Thomas Walsingham held the position of Royal Secretary. Walsingham had a wide range of diplomatic contacts and during travel on behalf of Elizabeth had developed a large circle of influential friends on the Continent and a considerable knowledge of geography and field conditions. Cecil and Walsingham remained the closest advisors to the Queen during the critical years of the war with Spain.

The military commanders were not in control of the recruiting of either medical practitioners or troops. The commander and his immediate subordinates were directed to undertake their military duties at the command of the Queen through the administration of the Privy Council. The administrative activities passed down a chain of command to Lord-Lieutenants, Sheriffs, and Justices of the Peace and other civic officers. They were granted warrants to act on behalf of the Privy Council to undertake the assigned duties.^{4.1} The Privy Council normally appointed the captains to serve in the field. The Privy Council endeavoured exercise control over all appointments under their supervision.

In the field, in Flushing, there was a general of horse, the Earl of Essex, the muster-master general was Thomas Digges, and the colonel-general of the foot was Sir John Norreys. Captains for the pioneers who were supposed

to have been appointed prior to leaving England were not appointed and Sir John Norreys was forced to make appointments. The Privy Council had overlooked this need, and Norreys was reprimanded by the Council for acting and making appointments in the field, thus illustrating the cumbersome command mechanism of the English army and the tight hold on activities which the Privy Council wished to enforce.^{4.2} A very important post in the initial command structure was the treasurer-at-war, Richard Huddleston.^{4.3} His role was significant because of subsequent deficiencies in pay became a major cause of discontent in the army. Lesser appointments were quartermaster, master-gunner, forage-master and a carriage-master. A sergeant-major was also an important appointment as part of his duties included arranging of battle formations.

In later years, Thomas Digges outlined his concepts of the ideal commander. He should be 'religious, temperate, sober, wise, valiant, liberal courteous, eloquent, of good fame and reputation'.^{4.4} In Cruickshank's opinion, Leicester may have failed in most of his tasks but it was unlikely that there was anybody else in England who would have succeeded^{4.5}

The commander would expect that the impressing system would ensure that adequate medical practitioners would be obtained. His prime problems would be to see that an adequate number of men were available for service and that they should fill the criteria drawn up by the Privy Council that the troops should be 'able and serviceable'.

Initially the surgeons were levied by warrants sent by the Privy Council to the Lord Mayor, who then passed the warrants to the Master of Company of Barber-Surgeons. When it became obvious that the requirement for practitioners was quite beyond the Company, some captains were authorized by the Privy Council to find their own surgeons without making a formal application to the Company. This was authorized by the Privy Council for the Essex expedition to France in 1591.^{4.6}

The ideal concept for a military surgeon was that:

He should be honest, sober, and of good council, skilful in that science, able to heal and cure all kinds of sores, wounds and griefs, to take a pellet out of the flesh and bone and to slake the fire of the same. He was expected to have equipment, a full set of instruments, and oils, balms, salves, splints, and bandages.^{4.7}

Leonard Digges, who died in 1571, had written a pocket book for army officers that outlined the qualities needed for military medical service. His son Thomas published the pocket book in 1590 after his father's death. He stated:

Many times (by unskilfulness of surgeons) small wounds are made sometimes maymes (maimed = loss of a limb) and some times mortall. It is therefore fit that no surgeon in any bande be admitted till the surgeon-major of the regiment have examined with his skill. He ought to be provided of a good chest of salves, oyles and waters for killing the heat of shot, and all such instruments as are necessary for his art; without which and his testimoniall from the surgeon-major of his sufficiency, he ought not passe muster, or receive pay. He ought to be careful, honest and loving to the souldiers he hath in cure, and besides his ordinary pay of the prince, he is to have monthly somewhat out of every souldiers pay, towards the charge of his chest of medicines, besides the rewards of such as are his abilities, to the end of the poore souldiers being cured gratis.^{4.8}

Leonard Digges set down ideals that were highly unlikely to be met even at the time of their publication by his son Thomas. As Cruickshank correctly states this contemporary theory was well ahead of practice.^{4.9}

Yet the terrible indictment of standards of the military medical surgeons by Clowes and Gale as seen by these two senior and very experienced military surgeons and were probably quite true. Clowes throughout his mature years appears to have tried to raise standards by his personal efforts within the Company of Barber-Surgeons and in his texts.

The serving officers also raised their concerns about standards and complained that they often failed to cure even slightly wounded men who ought to have recovered. The Privy Council was asked that instead of one surgeon for each company at a shilling a day there should be two for each regiment of ten companies. It was suggested that they should be paid at a much higher rate and out of that they should employ several assistants. They suggested a rate of five shillings a day.^{4.10} The Privy Council accepted this suggestion. The new system allowed a senior and experienced surgeon to oversee and to advise his junior colleagues.

Many of the captains would have been aware of the outcome of the good care taken for the health of the defenders of Metz and the need to copy similar measures to ensure good health. Evacuation of their own wounded as well as the enemy was improved. Some of the ideas apparently had been seen being used at St. Quentin and must have had some positive flow on into Flanders. Equally, it is very likely that Clowes had brought pressure to bear on members of the Privy Council to improve the medical service whose faults could not be disguised. Banister too had been on active service and would have been able to support Clowes. It is not apparent the Leicester himself took any part in improving the medical services for his forces. Clowes seems to have made no attempt to use his appointment to bring about medical changes in the field or did not record this in his texts.

Following the initial landing at Flushing in December 1585, the number of sick and ill would not have escaped the attention of seasoned soldiers such as the governor, Sir Philip Sidney. Others of great seniority and influence such as the Norreys brothers, Thomas Cecil and Francis Vere, would be likely to have played their role in looking for means to improve conditions.

The acts for mustering the forces required that the men be fit and able for service. It may be questioned how fit the general population was in the Tudor times. In particular, it may be asked how fit were the villagers from whom many of Elizabeth's troops would be drawn? An examination of the Tudor diet

by Andrew A. Appleby clearly shows that the rich ate vast amounts of meat whereas the poor were more and more dependent upon a monotonous diet of basic food grains.^{4.11} The village diet included oats and barley for grain; both wheat and rye appear to have been eaten by the yeomen and some gentry. Vegetables are unlikely to have been eaten regularly if at all until the reign of Henry the Eighth. William Harrison is quoted by Appleby, writing in 1578, saying 'they remained either unknown or supposed as food for hogs and savage beasts to feed upon than mankind'.^{4.12} They also avoided herbs thus as cabbage, leeks, lettuce and endives were held to be herbs, they were not cultivated. Onions were available through out the century. Under the teaching of Galen fresh fruit caused fever and diarrhoea, milk drinking was unpopular in adults as it was thought to be 'full of vapours, led to wind, colick and palsies'.^{4.13}

The refugees from the Dutch wars who settled around Norwich established market gardens and gradually the eating of vegetables and fruit increased.^{4.14} Towards the end of the sixteenth century, the rich had a change in dietary habits leading to the consumption of some vegetables.^{4.15} There is some speculation that the common eye complaints of the Tudor period may have reflected a lack of Vitamin A resulting in the eye disease, xerophthalmia.^{4.16} Probably many other vitamin deficiencies were present overtly or subclinically, certainly the vile environmental factors in the Flanders campaign could have made these conditions overt. All types of birds were consumed. There were 153 fish days each year and fruit was usually in abundance. The Privy Council in 1563 introduced an Act making Wednesday a compulsory fish day and appointing Justices of the Peace to ensure that butchers, innkeepers, and victuallers did not sell meat on fish days.^{4.17} This no doubt explains the frequent presence of fish ponds in English villages.

Ale, beer and wine were drunk often to excess by all classes. Butter was not a major item in the diet but fish was often fried in it. England had a great increase in population in the sixteenth century from 2.3 million people in 1522-5 to 4.10 million in 1601.^{4.18} This also coincided with a fall in the incomes of the poor and this change was to make cheaper grains the staple diet for the

poor. Notwithstanding the change in income and population changes in 1585, German and other foreign visitors considered England to be a prosperous country with a well-fed peasantry and citizenry.^{4.19}

Overall Elizabeth prior to her Flanders campaign was recruiting in a good time for health, as there had been good harvests from 1566 to 1585. The harvests were poor in 1586 and later from 1594 to 1597.^{4.20}

Appleby believes that the famine line was close in many areas as the harvests were not uniformly good and the expected work output fell.^{4.21} Who advised the poor about subsistence diets? Certainly in the Flanders campaign starvation was a major health problem and is it possible that many of the recruits were already malnourished prior to the campaign?

The health of the villagers was substandard. The men from whom an army was to be recruited may have been far from being physically strong. The farmer had pigs, geese and hens but farm economy was so poor that it is likely that these were sold at market along with eggs and honey. Few farmers appear to have grown peas or beans in all counties. It is impossible to find out from available sources if they ate fruit, vegetables or seasoning herbs that contained Vitamin C. Scurvy and rickets were reported as new diseases in the seventeenth century. Perhaps previously the symptoms had been mixed with the general miseries of the population and not differentiated.^{4.22} By the end of the sixteenth century there was widespread malnutrition and famine, no doubt directly related to the deficient harvests of 1594, 1595 and particularly in 1596 and caused a resulting inflation.

The question must be raised about how many of the volunteers enlisted because of unemployment and famine conditions in some areas.

The suggested daily rations for the Elizabethan soldier in the field towards the end of her reign were laid down with a little variation from time to time.^{4.23} Calculations by the author show the following: -

Bread	about 2 pounds	150 gms.	750 calories.
Flesh (?lean)	1 pound	75 gms	325 calories
Wine (?10%)	1 bottle (say 1 l.)	1,000 gms	<u>400</u> calories
			1575 calories

Cheese was offered as an alternative to flesh in the same weight = 675 calories, and 2 bottles of beer in lieu of wine = 800 calories. The beer was important as it was recognized that drinking water could be followed by disease. No account has been taken in these rough calculations of fatty meat that could have added to total calories, nor of porridge that could also add significant calories. As a rough approximation, it is suggested that the active soldier in the field was offered between 2,000 to 2,500 calories.

The medical expectations of the military commanders were limited to filling the desired ratio of 1 practitioner to 100 men. The commanders may have expected that the men should be 'fit and able' to enable a strong fighting force however they were not in charge of the levy process and had to put up with the men they were given. Unfortunately the basic requirement to be 'fit and able' appears to have been often not met but may have reflected the poor health status of the general English population whose diet was at times barely above subsistence level. The extremely unsatisfactory skills of the 'practitioners' was recognized as the Flanders campaign progressed by a few captains who recommended that better pay and conditions would lead to more able men being recruited.

REFERENCES

^{4.1} Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p. 48

^{4.2} *Ibid.* p.41

^{4.3} Guy, John. *Tudor England*, (Oxford University Press, Oxford, 1988), p.337

^{4.4} Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p.37.

- ^{4.5} Ibid. p.34 quoting T.Digges, *An Arithmetical Military Treatise*, p.138
- ^{4.6} *Acts of The Privy Council, Preface*, New Series, (H.M.Stationary Office, 1897), 17:27 and Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p.120 and p.41
- ^{4.7} *Acts of The Privy Council, Preface*, New Series, (H.M.Stationary Office,1897), 18:122 and Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, Oxford, 1946). p.120
- ^{4.8} Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p.48
- ^{4.9} Ibid. p.122
Health, Medicine and Mortality in the Sixteenth Century, (Cambridge University Press, Cambridge, 1979). p. 116
- ^{4.10} Appleby, A. B. 'Diet in Sixteenth Century England: Sources, Problems, Possibilities.'
Health, Medicine and Mortality in the Sixteenth Century, (Cambridge University Press, Cambridge, 1979). p. 116.
- ^{4.11} Ibid. p. 116
- ^{4.12} Harrison quoted by Appleby, A. B. 'Diet in Sixteenth Century England: Sources, Problems, Possibilities.', *Health, Medicine and Mortality in the Sixteenth Century*, (Cambridge University Press, Cambridge, 1979). p. 98
- ^{4.13} Appleby, A. B. 'Diet in Sixteenth Century England: Sources, Problems, Possibilities',
- ^{4.14} Copeman, W.S.C. *Doctors and Disease in Tudor Times*, (Dawsons of Pall Mall, London, 1960), p.157
- ^{4.15} Ibid p.158
- ^{4.16} Guy J. *Tudor England*, (Oxford University Press, Oxford, 1988). p. 317
- ^{4.17} Ibid. p. 32
- ^{4.18} Slack, P. 'Mortality Crises and Epidemics, 1485-1610' *Health, Medicine and Mortality in the Sixteenth Century*(Cambridge University Press, Cambridge, 1979). p. 16
- ^{4.19} Appleby, A. B. 'Diet in Sixteenth Century England: Sources, Problems, Possibilities', *Health, Medicine and Mortality in the Sixteenth Century*, (Cambridge University Press, Cambridge, 1979). p. 116
- ^{4.20} Ibid. p. 104
- ^{4.21} Heizmann, Charles L. 'Military Sanitation in the Sixteenth, Seventeenth and Eighteenth Centuries' *Annals of Medical History*, (Paul Hoeber, New York, 1917). Fall issue, 1:284
- ^{4.22} Appleby, A. B. 'Diet in Sixteenth Century England: Sources, Problems, Possibilities', *Health, Medicine and Mortality in the Sixteenth Century*, (Cambridge University Press, Cambridge, 1979). p. 116
- ^{4.23} Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p.56

CHAPTER 5

LEVYING THE MEDICAL PRACTITIONERS AND MILITARY FORCES

The undertaking given by the Company of Barber-Surgeons to supply surgeons as outlined under charter of King Henry the Eighth in 1530 did not exclude the surgeons from conscription as ordinary soldiers, much to the discomfort of the Company. On 26 March 1556, Thomas Knot, the then Master of the Company petitioned the Lord Mayor of London. He sought the exemption of the Company from finding or setting forth any members as soldiers or as men of war at any time thereafter when it might be that the Citizens of London may be required to do so, either by sea or land.

Forasmuch as the same Company are always at such tyme and tymes very sorely burdened and chardged otherwise hereafter expressed, that is to saye, they are comaunded and bounden to prepare and fynde so manye Surgeons and so many other men attendinge upon them at every tyme and tymes that it shall fortune the King to send out soldiers by sea or land, and the same Company doe always prepare fynde and send furthe for every one houndreth of suche Souldyers one Surgeon and a man attending upon him.

The Lord Mayor and the Aldermen responded with a reply, which indicates that the scribe was probably a paid public servant, as it was written in typical bureaucratic form.

That on future occasions when the requisition might.

Fortune to be layed or appointed to or upon theym, that then they in every such case suche case upon their gentle suyte and request made unto the Lorde Mayor and courte of Aldermen for the tyme beinge for and concernynge their sayd discharge for and in consyderacon of the causes above remembered, shalbe as gentelye and charytably holpen eased and releaved in that behalf as the wayte and ymportaunce of the

burden that the Cytie at every suche tyme shalbe chardged wth all will reasonablye permytt and suffer.

The Master was asked to record this agreement in the Book of Ordinances of the Company as 'a remembrance', a verbal promise for the time being! This was in the time of Queen Mary.^{5.1} It was not until 1561 that Surgeons were officially not obliged to act in the ranks as soldiers.^{5.2} On 5 April 1570, a petition was sent to Queen Elizabeth seeking to be excused from 'providing soldiers'; it would seem that the Company had a role in recruiting.

105,830 men were levied in the period 1585-1602 for service abroad and of these 17,170, between 1585 and 1587, had the Netherlands as their primary destination.^{5.3} Added to this number were an unknown number of reinforcements. Such raw figures on face value would indicate that initially the Flanders Army would require at least 172 medical practitioners to enforce the suggested ratio of one surgeon to each 100 men as previously determined. Added to this number was a requirement to provide surgeons for the navy. Queen Mary's refurbishment of the navy resulted in 1557 of twenty-one first line men-of-war with others nearing completion or repair.^{5.4} There would be a need for a further twenty-one practitioners, thus overall it is not unreasonable that they looking for a total of 200 practitioners to serve in the armed forces. Later, between 1591 to 1602, to service the 16,525 further men for France and the Netherlands would require large numbers of medical practitioners.^{5.5}

The Annals of the Barber-Surgeons Company makes no note of greater demands upon them other than to help to pay for armour and clothing by means of Elizabeth's lottery in 1585. They were also to buy and store gunpowder in 1586 and in 1589. Between 1596 to 1598, on various excuses the Company contributed £170 to the cost of the wars but there is no comment about manpower requirements.^{5.6}

An estimate of the medical practitioners in London from 1580 to 1600 by Pelling and Webster provide the following figures:

Physicians.	50 in the College of Physicians, whose status varied.
Surgeons.	100 Surgeons in the Barber-Surgeon's Company.
Apothecaries.	100 in the Grocers and other Companies.
Practitioners.	250, both licensed and unlicensed. ^{5.7}

These figures give an overall total in London of 500 whom in one guise or other could be counted as medical practitioners and to recruit the required 200 practitioners from London alone would be clearly beyond the available manpower. Clowes was well aware of the demands being placed upon the medical practitioners. He wrote in the conclusion to his 'proved practices':

It may seeme incredible, that there is not at this present time of sufficient and able chirurgeons to bee found in London, scarsely halfe the number which were lately employed, in her Majesties service, with General Norrice (Norreys) and Sir Fraunces Drake.

Clowes was referring to those practitioners who he would classify as *bona fides* surgeons. The book was published in 1591 however the introductory pages make it clear that there had been previous notes written by Clowes. It is likely that his comments about available surgeons refer to the situation in 1589 when the Drake-Norrey expedition involving 23,000 men was launched to attack the Iberian Peninsula. The medical force required from the old scale would be more than 200.

Outside of London, there may have been a pool of practitioners in the provinces. Norfolk for example in 1565 received as many as 4,000 Dutch and Walloon Protestant refugees known locally as the 'strangers' and they made up a further group of practitioners in Norfolk. Late in the 1500s after the influx of refugees, 'strangers' made up one third of the population and their medical practitioners appear to have looked after the medical needs of their own people.^{5.8} Clowes states clearly his opinion of this group

I must be temperate and milde in this my writing, and not speake all I knowe: for their number is great, and they have many friends that sing

their fame farre. There is knowne to be in London, which to practice Chirurgery, of strange women born beyond the seas, called by some, cunning or wise women, more in number, than there are of surgeons lawfully allowed and admitted, according unto the lawes and statutes of this realme, being fit men to do her Majesties service in their arte. There be also in like manner at this present (time) to be found in London besides those afore said, of our own countrie women, that hath neither wit nor arte, which daily practice Phisicke and Chirurgerie, without any penalty and punishment.....it is greatly to be lamented, or rather pitied, that these blind and ignorant women should be thus fostered and suffered; for they will be the causers of many evils, whereby her Majesty shall have great want of sufficient and faithfull Chirurgeons to be found in England able to do service in the time of warres', (figure 4).

Although a Guild of Barbers dated from the fourteenth century in Norwich, from 1550 the group changed their name to the Company of Barber-Surgeons and Physicians. In the whole century, only seventy names appeared in the records.^{5.9} Apothecaries were active in Norfolk but appear not to have been affiliated with the Barber-Surgeons but with their traditional grocers and mercers guilds. It appears that they did not influence the Company structure as they were being neither accepted nor rejected.^{5.10} Pelling & Webster conclude that between 1570 and 1590 there were seventy-three practitioners in Norwich, thirty-seven surgeons, twelve apothecaries, ten woman practitioners, eight miscellaneous practitioners. The combined population of Norfolk and Suffolk by 1600 was about 250,000 persons.^{5.11} In the whole of this area 250 practitioners (excluding midwives) were practicing giving a ratio of 1 per 1,000 of the population. This is probably an underestimate for various reasons including the fact that many rural practitioners had no formal organizations. Thus their numbers can be only a guess, with a ratio of 1:400 being more likely.^{5.12}

The population of England in the sixteenth century had greatly increased from an estimated 2.3 million in 1522-5 to an estimate of 4.10 million in 1601.

Practizers in Chirurgerie.

by are very well able to live and maintaine themselves, according to their calling. Yet all that will not serue the turne: for my good mistris his wife, will needes become a Whilition and a Surgeon: and (forsooth) he must followe her presumptuous minde to paynt her out in silkes & veluets in the highest degree: for that carrieth credite to her cunning, and brings in monie plentifully. A thing greatly to be lamented, or rather pitied, that these blind and ignorant women should be thus foresered and suffered: for they are and will be the causers of many euils, whereby her Maiestie shall haue great want of sufficient and skillfull Chirurgions to be found in England able to do seruice in the time of warres. And vntesse God of his mercifull goodnes do moue the hearts of godly Magistrates for speedie redresse, they will bee the only ouerthrowe of Chirurgerie in this land. For it is come to passe at this day, that very fewe men being of any credite or account, that hath brought by his sonne in learning, the which is greatly to be requited in a good Chirurgion, but he refuseth to put him to be an apprentise vnto the Arte of Surgerie. And why? Because there are in these dayes, in towne and countrie, such a number of abusers that practise Chirurgerie, which are the onely doers and cause of all these euills. It may seeme vncredible, that there is not at this present time of sufficient and able Chirurgions to bee found in London, scarce halfe the number which were lately employed, in her Maiesties seruice, with Generall Norice & Sir Fraunces Drake: And yet the greater sort of those that are gone, are very poore men, and so poore in deede, that some of them went out very slenderly furnished: some with a litle Chirurgerie Kuffe in a schollers satchell: other some in budgets, & bagges, being very vnfit furniture to serue in her Maiesties seruice. Unfortunate and unhappie shall that Souldier be, that tasteth of these Surgeons wants. And the chiefe causers of these euills, are those abusers aforesayd. Moreover, what a pitifull thing is it to heare, that at their departure from their poore wiues and children, leauing them in such extreme necessitie, that or euer they arrived at the first Port, their wiues and children complained, and craued

Such abuser
cannot be
enough spoken
of.

To all the young

The conclusion, of a wicked brood of beastly abusers of
Phisicke and Chirurgerie, daylie more and more in-
creasing, to the vtter vndoing of many: as here briefly
shall be declared.



Let this my collection (gentle and bertu-
bus reader) I meane by Gods yernillid,
and your courteous patient, here truly
and faithfully to deliuer vnto thy sight,
the manifold and iniurious abuses of a
disordered number of prouling women,
daylie practising Phisicke and Chirurg-
erie, within this Citty of London, and the Hverties of the same,
whose knowledge and iudgements (I say) is fallible and vn-
certaine, whereby they are the causes of many hidden mis-
chiefes. Therefore, without further protestation, I will as
briefly as I can for examples sake, as it were, poynt at a few,
in respect of the rest: which abusers are bred and crept in a-
mongst vs through sufferance, with whom, notwithstanding
I must bee temperate and milde in this my writing, and not
to speake all I knowe: for their number is great, and they
haue many friends that syzed their fame farre. There is (I
say) knowne to be in London, which daylie do practise Chi-
rurgerie, of straunge women bozne beyoud the seas, called of
some, cunning or wise women, more in number, then there
are of Surgeons lawfully allowed and admitted, according
vnto the lawes and statutes of this Realme, being sit men to
do her Maestie service in their Arte. There be also in like ma-
ner at this present to be found in London, besides those afore-
sayd, of our owne Countrie women, that hath neither wit, nor
arte, which daylie practise Phisicke and Chirurgerie, I will
say little of their dealing in Phisicke, because it is also openly
knowne, farre more in number then there is of the straunge
women. But all these abusers practise Chirurgerie, without
any penaltie and punishment, and the most part of these haue
husbands of diuers honest trades and occupations, and there-

Figure 4 Clowes' conclusion to 'Prooved Practice', 1591

^{5.13} Taking a great liberty by assuming uniform medical practice across England and using the extreme figure of 1:1000 ratio, perhaps 4,000 practitioners existed in England in toto in 1601. Thus if the provinces were culled for practitioners for the armed forces; there would be a major practitioner shortfall for the population at large as predicted by Clowes.

The levy of over 100,000 men during the seven years from 1585 to 1602 raises the question about how many were truly fit and well enough for military service. ^{5.14} As has been outlined previously, England had no standing army. The only permanent armed force to attend to the Queen were the Yeomen of the Guard. Various small forces had come and gone with various regimes. There was from 1509, a group of young noblemen, the Gentlemen Pensioners who were a permanent force but of doubtful competence. ^{5.15} Some semi-military moves were made almost independently of the Crown. In 1537, the Guild of St. George was formed in the City of London 'to be overseers of the science of artillerie, that is to witt, long bowes and hand gonnnes'. Certainly Henry the Eighth had been a great exponent of the need to be trained in the use of the longbow. Subsequently this livery company became the Honourable Artillery Company, and a reserve force of the Crown. Its function at first was to exercise in handling longbows and handguns. It trained the officers of the 'trained bands'. The word artillery in these early days meant only a projectile weapon and it was purely an infantry company. In 1539, a great review was held by King Henry of 15,000 London militiamen or 'trained bands'. It is unclear how well supervised and drilled the 'trained bands' were subsequent to King Henry's death. The bands became a group of great importance to Elizabeth's army as they certainly had experienced some military training.

Elizabeth however had inherited from Mary the two pivotal Acts from which some guidelines were able to be followed regarding the obligations of the civilian population to support the Crown in the time of peril. Under the old feudal system of loyalty to a feudal Lord, the troops were only obliged to give service overseas for a period not beyond six weeks. Queen Elizabeth quickly forgot this previous understanding.

Of the two Acts of Mary, the first was 'An Acte for the having of Horse, Armour and Weapon'. The second was 'An Acte for the taking of Musters'.

Mary's Acts tried to remove some of the means whereby able-bodied men were able to avoid their civic duty. There were the men who had not bothered to train and those who had bribed officials for release from their obligations. For those that had been recruited and deserted, Mary reimposed a law of Edward 6th causing desertion to be rated as a felony.^{5.16} However strangely neither Mary nor Elizabeth made it clear that the recruits were to be expected to give foreign service on an indefinite basis.^{5.17} The previous declaration of obligation under Edward the Second was 'that no man be compelled to go out of his shire, but where necessity requireth, and sudden coming of strange enemies into the realm.'

In 1560, a total of only ten days spread over the year was spent on military musters. Another activity under the Acts was to assess what additional revenue and obligations could be gained from the population based on their assets. Considerable trouble arose in defining the value of the individual's contribution and the mean by which the value of their goods could be calculated. Certainly it would appear that the temptation was to cheat and the data received by the Privy Council was flawed if the local administration was lax. This was partly overcome by the Council 'setting' a figure to the number of men that it expected to be classified as able-bodied. Sir William Cecil and others on the Council were very aware that the militia had performed poorly in the Scottish campaign of 1560 and that the levying system was seriously inefficient.^{5.18}

Elizabeth decided in 1583 to organize better training for the 'militia', selecting a desirable figure as one tenth of the theoretical available 250,000 men who were calculated to be able-bodied and between the ages of sixteen and sixty years. By 1575, there were 182,929 men registered in the national musters. Of these, 11,881 received special training and weapons, 62,462 were equipped but untrained, and the remainder were neither trained nor provided with weapons but reserved as unarmed labourers or as pioneers in

emergencies. There were 2,835 cavalry.^{5.19} Notwithstanding the pressure to have better training, the results were less than ideal. In 1591, there were 42,000 men trained and equipped, 54,000 equipped but not trained and 6,000 neither trained nor equipped.^{5.20} Between 14% to 18% of able-bodied men theoretically available were levied for overseas service between 1585 and 1602.^{5.21} Throughout this time the England and Spain were in continual conflict, but by the end of 1588 the Armada threat had diminished. However overall there remained about the same number of troops under some type of military obligation as there were in 1575. After Elizabeth's death on 24 February 1603, there was an interim period when armed forces on the same scale were still required as the state of war still existed. In 1604, King James the First guided by Lord Cecil ended the Spanish war.^{5.22}

The fit men trained and armed would constitute the most efficient fighting men; the Crown decided that if possible they should be left at home to be the strongest force for national defence. This policy of keeping the best at home caused the remainder of the eligible men to make up the bulk of the possible conscripts for the Flanders army. The policy led to the overseas contingents being 'full of worthless creatures trying to escape foreign service'. The bulk of Elizabeth's army on overseas service was made up of untrained men who were conscripted against their will. There were some volunteers and also a small number of Gentlemen Volunteers who may have chosen a military career as a means of civil advancement. Leicester's allocation was 4 Gentlemen Volunteers per company of 150 probably limited in numbers by the Privy Council as they needed to be paid for their services.

An indenture dated 13 August 1594 gives some idea of the breakdown of the composition of the levy at that date, five years after the initial force to the Netherlands, (figure 5). Sir Thomas Scott and Sir John Leveson as Deputy-Lieutenants of the County of Kent had raised and outfitted 250 men. Eighty-five were armed men, sixty-five were musketeers, one hundred had been trained as calivermen and eighty-five had corselets. The 250 had liveries made up from grey russet, a coarse homespun woolen cloth. They had been delivered to Gravesend and each soldier had been paid two shillings at the

No. 4. *Early Indenture for Troops*¹

THIS Indenture made the Thirteenth day of August in the six and Thirtieth yeare of the Reigne of our soveraigne Ladye Elizabeth by the grace of god Queene of Englande, France, and Irelande Defendor of the Faythe: Betweene Sir Thomas Scott and Sir John Leveson knightes Deputee-Lieutennants to the righte Honourable the Lords Cobham Lieutennant of the countie of Kent to our said soveraigne Ladie in the one partie, And Captaine George Morton on the other partie witnesseth that whereas the nombre of Two hundred and Fifty Souldiers have been leveyed and furnished within the same countye by ordre from our sayde soveraigne Ladie, for her Majesties servise, whereof Fourescore and fyve are Armed men Threescore and fyve Musketyres and one hundred calyver men nowe by the said Captaine George Morton doth by these presentes acknowledge, that he upon the daye of the date hereof hath had and received at Gravesend in the sayde countye of Kente by the delyverye of the saide Sir Thomas Scott and Sir James Leveson aswell the nombre of Fourescore and fyve good and suffycient Corselets furnished, Three score and fyve Muskets furnished, and one hondred Calyvers furnished, And two hundred and fifty grey russet suitable lyveries for the said two hundred and fyfitye: As also the nombre of Two hundred and fiftie hable and serviceable men whose names followeth viz.

William Totwell George Lightfoot (and 248 others)

And the said Captaine doth further more by these presents that they the sayde Sir Thomas Scott and Sir John Leveson by the handes of their men in his sighte have payed to everye of the saide souldiers the some of two shillinges before the ensealinge hereof. In wisse whereof the sayde parties to these presentes have inter-changeblye sett their handes and seales the day and yere above written.

JOHN LEVESON.
GEORGE MORTON

Figure 5 An indenture for levies in Kent, 1594,
Cruickshank, p.138

time of their formal enrolling.^{5.23} By this time, the men had received sufficient training to be classified for their military role.

There appears to be no comprehensive information about the levies for the first official expedition to the Netherlands following the Treaty of Nonsuch.^{5.24} Subsequently data was collected (figure 6). Unofficially, there had been small groups of volunteers leaving for the Netherlands to assist the Dutch Revolt. Captain Thomas Morgan raised a company of 300 picked men from the London 'trained bands' who arrived just in time to prevent the loss of Flushing to the Spanish, (figure 7)^{5.25} Morgan's band was the first English band to be equipped with muskets. There had been some other bands of volunteers who had served in Holland. Another band had been under the command of one of the professional soldiers, John Norreys^{5.26}

The feudal concept of service to the Lord of the shire, which still remained in some areas, can be shown by the example set by Sir Thomas Scott when the Armada was thought to be imminent. It is said on his memorial plaque in Brabourne Church in Kent that he raised 4,000 men in one day on the eve of the Armada (figure 8). However only 10,880 troops had been raised in Kent for this crisis and over all only 2,958 were both armed and trained.^{5.27}

Elizabeth had a muster of her 'trained bands' in 1588 which showed 'Capteynes and Colonells in all forty-seven, Ensigns in all forty-five, Soldyers in all 7,100 whereof pykes 2,350, Calyvers 4,750' (A caliver was an arquebus with a uniform bore).^{5.28}

The steps taken to improve training and examination of the militia status must have had some propaganda value. In 1580 the Spanish Ambassador reported that a total of 25,000 men could be assembled on any point on the English coast within twelve hours of the firing of the systems of warning beacons. When the threat of Spanish invasion reached the point of reality in 1588, defence plans were drawn up. There were to be four defence areas, to the north 12,000 men to watch the Scots, 29,500 to the south to shadow the Armada and an army of 73,000 of mixed training to protect the Queen's

No. 3. *Origin and Destination of Troops levied in English Counties between 1585 and 1602*

<i>County</i>	<i>Ireland</i>	<i>France</i>	<i>Netherlands</i>	<i>Total</i>
Bedford	419	250	600	1,269
Berks.	469	480	675	1,624
Bucks.	636	380	675	1,691
Cambridge	572	150	450	1,172
Cheshire	902	..	150	1,052
Cornwall	595	350	..	945
Cumberland	..	..	..	..
Derby	773	..	75	848
Devon	1,490	750	150	2,390
Dorset	470	600	260	1,330
Durham	..	..	..	..
Essex	1,199	800	1,100	3,099
Gloucester	1,692	500	400	2,592
Hampshire	641	1,400	525	2,566
Hereford	1,110	..	300	1,410
Hertford	539	600	675	1,814
Huntingdon	398	150	50	598
Kent	750	2,250	1,600	4,600
Lancashire	1,346	..	300	1,646
Leicester	547	150	..	697
Lincoln	1,345	300	300	1,945
London	1,600	4,420	3,495	9,515
Middlesex	195	250	600	1,045
Norfolk	900	450	600	1,950
Northampton	1,059	450	600	1,859
Northumberland	..	..	..	..
Nottingham	737	150	..	887
Oxford	544	440	650	1,634
Rutland	220	50	..	270
Shropshire	871	138	..	1,009
Somerset	1,194	1,200	460	2,845
Stafford	648	..	75	723
Suffolk	1,100	450	700	2,250
Surrey	85	200	550	835
Sussex	500	2,060	550	3,010
Warwick	761	150	475	1,386
Westmoreland	..	..	..	..
Wiltshire	795	350	560	1,705
Worcester	1,151	..	..	1,151
Yorkshire	1,810	400	400	2,010

Figure 6 Table of troops levied in English Counties, 1585-1602.
From Cruickshank, p.138

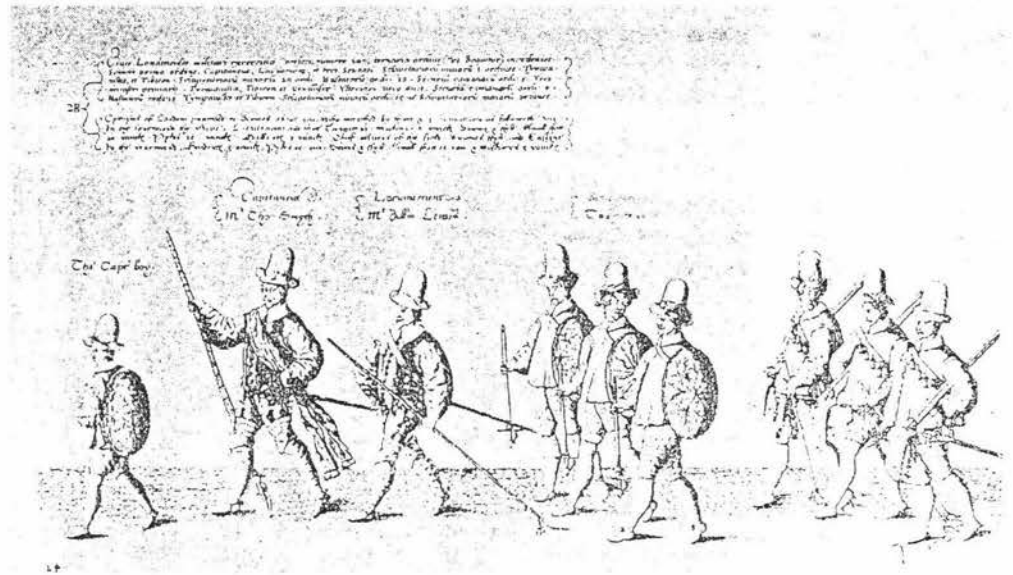
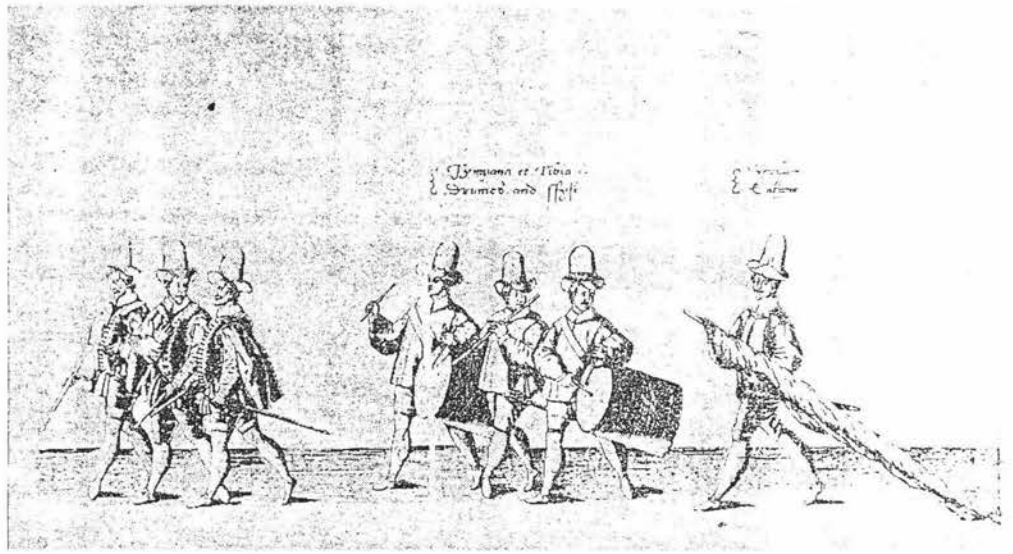


Figure 7 Procession of London 'trained bands', 1587.
Barthrop, p.18

person. A further field Army of 17,000 of foot and horse was placed under the leadership of the Earl of Leicester.

The conscripts for Elizabeth's army were of two types: those men who had been in employment and those who were the 'masterless men', the rogues and the vagabonds. The masterless men were given a pardon, including outlaws and malcontents if they joined the army. Elizabeth went as far as releasing criminals from Newgate prison to assist Warwick's forces at Le Havre, but it does seem that the emptying of prisons occurred rarely. All these were certainly likely to have had no military training. In 1585, Lord Howard was instructed to call up all unemployed in Surrey and Sussex. He organized raids on fairs and popular meeting places, all in a swoop they were escorted to Rye by constables.^{5.29} Rogues and vagabonds certainly formed part of the force sent to the Netherlands in 1585.^{5.30} In view of the recruiting style of the levies that allowed fit men to bribe their way out of service, it is not surprising that the dregs remained.^{5.31} Many captains confessed that they had been bribed £30-40 by some to be dismissed from the recruiting press. These were the well to do; the lesser group could not have raised this amount of bribe. Dealing with recusants in February 1586 it is recorded in the Acts of the Privy Council, that the Privy Council issued instructions about how to deal with the recusants as follows,

The common and inferior sort that are daily led and perverted by the recusants and suggested that 200 should be sent to Leicester in the Low Countries to be employed as pioneers.

This phrase can be interpreted as indicating that being sent to the Netherlands was a punishment.

Later in the recruiting for the Netherlands, Irish troops were levied included the kerns, a group of Irishmen who were accustomed to walking on stilts. The direct role of the Irish mercenaries was unclear, it is also unclear who was their commander and to which captain they belonged. The Spanish recognized them as being the 'kerns' and the wildest and fiercest of the

'barbarians'. 'They were said to be naked brigands, that they ate raw flesh and spoke no intelligible language.'^{5.32} These tales would provide excellent material for their propaganda value and combat the confidence of the Spanish. The Oxford Shorter Dictionary states that the word kern dates back to 1553, well before this campaign.^{5.33} The 1500 Irish auxiliaries were said to dispense with clothing, wearing only an apron, probably a kilt. They stalked about the fens on stilts, burning, butchering and maltreating the villagers, with little regard for the laws of Christian warfare. The loyalty of the Irish recruits was questioned in the Privy Council prior to their enrolment, as it happens correctly, for after the disaster of the surrender, a few remained loyal, but the majority changed to the Spanish side.^{5.34}

There must have been an impression that troops would be able to transverse the marshes and that they would have a definite role to play in Flanders. The Privy Council on 24 April 1586, prior to the Deventer setback, sent a special recruiting agent to Lincolnshire to impress a number of 'scratchmen' or 'stiltmen' from the marshmen for use by Leicester's army.^{5.35} They were to be offered a special rate of pay. It is not clear if this force joined the previous Irish group or if their loyalty remained.

The poor types of men recruited were reflected by Leicester's opinion of them when he arrived in the Netherlands to command his troops.^{5.36} Leicester was very disappointed with the levy forces that were sent after his initial group. He described them as swaggering ruffians from the disreputable haunts of London, cockney apprentices, broken down tapsters, discarded serving men; more at home in tavern-brawls or in dark lanes. He spoke with grief and shame of the worthless character and condition of the English youth sent over to the Netherlands. He bemoaned trying to build these into serviceable troops.^{5.37} Leicester also may have been too harsh. It may be asked what experience he had had with the common folk of London as he rode in his privileged manner as was appropriate to his rank.

The levied soldier was paid coat money for a uniform, conduct money to cover the expenses of the march to the port of embarkation. The sum of

money was eight pence daily which was considered adequate for a fifteen mile march and also to provide lodgings at the end of it.^{5.38} The local citizens were expected to pay for the coat money.^{5.39} There was no standard colour for the coat that often took a colour representing the county. The levied troops were required to pledge allegiance to the Queen, also as to any part of the command of the Earl of Leicester when they received their first pay.^{5.40}

The men were to be transported in hired vessels at the embarkation ports. Delays were frequent and often the men were not given adequate funds to buy their food, they frequently deserted and were often hungry. The ship owner was paid three shillings per head to transport the men excluding provisions.^{5.41} Sir Edward Norreys wrote about of five companies of men who were transported in 1585 to Flanders in bad weather. The crossing took ten days in toto following many setbacks during which the men were kept in the boats. The poor start was followed by eight days lodged in the drafty church at Middelburg; the experience resulted in many men becoming sick many of whom died.^{5.42} His experience reflects the likelihood that the men were in poor health and condition prior to leaving England.

The uniforms provided to the army by private contractors were supposed to be re-issued twice a year. Some men were better outfitted than others. By 1590, the private soldier in the army was supposed to have a cassock, doublet, a pair of venetians (breeches of cloth at first made in Venice but later copied in England), hat, two shirts and bands, three pairs of stockings and three pairs of shoes, (figure 9). By 1597 there was also a summer uniform for the troops in the Netherlands and a sturdier winter outfit. In 1588, there was an upset between the Burgomaster at Flushing and the merchants as he wished to impose import taxes on the uniforms for the troops.^{5.43} Notwithstanding the better quality and thickness of the winter uniform, the Earl of Essex in 1599 in the Irish campaign complained that the English uniform was too short and did not give adequate protection from the cold.^{5.44} The supply of clothing for the Elizabeth's soldiers and their delivery to the soldiers was quite disorganized. There were complaints that the captains of the companies were



FIG. 16. The Yeomen of the Guard, 1558 to 1600.

The brasses of John Kent (Fig. 16D) and Robert Rampston show them wearing the ordinary livery with Venetians. The dress in each case is similar except that Rampston has bands or stripes on the outside of his breeches.

At the end of the reign wide open hose made its appearance in place of the Venetians, as shown in Fig. 18A, taken from a MS. in the Royal Library, Windsor. The wide dark violet hose are guarded with narrow gold lace, the doublet is also violet, and the stockings white.

The Guard formed the escort to the Queen at Tilbury at the time of the Armada.

Figure 9 Yeomen of the Guard

withholding the uniforms for their own gain raising the underlying suggestion of fraud.^{5.45} Complaints about fraud at various levels appear to have caused Elizabeth's agents, Wilkes and Davison to investigate many areas of the army involving both suppliers and within the distribution mechanism for money and goods. Davison was quite a senior figure in Elizabeth's civil servants, he was second Secretary of State and Gentleman in Ordinary to her Majesty between 1586 to 1587.

It was not surprising that many contractors and captains were accused of fraud but also at the highest level, the treasurer-at-war Sir George Carew was accused of large scale fraud, but escaped conviction.^{5.46} A disgruntled merchant, William Holliday, who had tendered unsuccessfully for uniform supply, said that between 1597-1600, of each 1,000 men only 600 actually received their uniforms, the remaining 400 were shared between the captains and the merchants.

The clergy had long been expected to share the military burden by providing for the cavalry. Under Elizabeth this expectation continued. In 1585, they were asked to help to equip 1,000 horses and give £25,000 at a rate of £25 pounds per horse; in 1598 the sum was raised to £30 per horse.^{5.47}

In 1586, the second year of the Army in Flanders, six captains of recognized ability were sent to recruit a defined number of troops. The captains knew the calibre of the men they were to recruit and could judge their abilities.^{5.48}

Sir Humphrey Gilbert had instituted the idea of companies of men forming regiments in 1572. It remains speculative the effect this type of structure would have had on the troops if it had been used in the 1585 Flanders campaign. There may have been closer captain/troop cohesion with better communication between the men and possibly some easing of the troubles of mind and body. The company was nominally to have 150 men and a captain, however in Flanders the average was only eighty men.^{5.49} The Privy Council usually appointed the captains, but in the early days in Flanders some private

companies were recruited.^{5.50} The company theoretically had a lieutenant, an ensign bearer, two sergeants, two drummers and one surgeon.^{5.51} Each company also had a clerk, a non-combatant who kept records of all types including musters and also issued powder, match and bullets for which the soldier had to pay. He was required to visit all sick men weekly. The company was supposed to have a preacher but this requirement was rarely enforced.^{5.52}

The county Lord Lieutenant system as set up by Mary was now fully employed, as they were the ultimate agents of the Queen in the counties. Sheriffs and Justices of the Peace were also involved in the levying activities.

The demand for troops for active service against the Spanish was increasing as Elizabeth's reign progressed without any corresponding willingness for service. Another problem which was recognized early in the Flanders campaign was that no provision had been made for replacement in the units of loss of personnel by death, desertion and loss by sickness causing the soldier to be so unfit that he could not continue as part of the force. The result was that most units were permanently understrength and the Privy Council may have had an inflated view of the numbers actually actively serving. Sir John Norreys had complained of the rate of desertion among the levies of 1585. Leicester in 1586 also complained that of 1,100 troops 300 had run away although most had been recaptured.^{5.53}

The population probably knew the woeful reputation of service in the Netherlands campaign by word of mouth and possibly from the tales of the few veterans who were able to return to England. In 1587, a company levied in London for service in the Netherlands mutinied. The Lord Mayor was instructed to see that the mutineers were punished with 'some severe and extraordinary correction' that included flogging through the city streets, the use of the pillory and the loss of an ear. Despite this example there was a further major mutiny in Bristol in 1602.^{5.54}

An assessment of the captain's opinion of the character of the troops, that included the levied vagabonds, can be judged also by the rough justice that appears to have been their lot if caught out in a misdemeanor. Sir Roger Williams reported that he had 'trussed-up' three plunderers and had ordered the strangling of two soldiers in their billets for causing a disturbance.^{5.55} There were three soldiers executed for attempting to release one of their colleagues from the custody of the provost marshal and many other matters requiring 'discipline'.^{5.57} The officers responsible for discipline were the marshal, the judge-marshal and the provost marshal. The offender initially was tried at the marshal's court at which the man's captain and other witnesses could appear.^{5.58} With starvation and general malnourishment being often the root cause of complaints and disobedience, there may have been a role for the medical practitioners, to seek clemency for the men on medical grounds. However the practitioners were regarded as fairly low in the military hierarchy and their opinions would if sought probably be given little credence.

The Privy Council further burdened the captain in the field in 1594 by an order that he must make good any shortfall within his ranks. He was paid for his efforts by the company mustermaster, and was also paid to provide the levied man with uniform and arms. This scheme was systematically exploited by fraud.

In the early stages of the Flanders campaign, the first large gathering of the troops as a fighting force occurred when they had reached their destination. The arrival of the men was fragmented by the irregular arrival of the transport ships. Many of the troops were in a wretched state when they and their commanders arrived on 'foreign soil'. It would be incorrect to assume that all were mentally numb, they would have good reason to question among themselves how their plight had come about, and to question the skills and knowledge of their military commanders. These soldiers were entirely without pay after their arrival in Flushing and Davison, the Queen's agent with the force, had to borrow to provide them with both money and clothes.

The commanders were all young commanders and their companies neither so strong nor well furnished.....as had been convenient and of those a great many sick and some dead by the way. ^{5.49}

Both Sir Philip Sidney and Sir Thomas Cecil were given by Queen Elizabeth very strict orders to:

Enforce the good behavior of her soldiers towards the townspeople and hold all in the town in very singular esteem hoping that on their part they would yield her garrisons due honours and obedience and give them welcome and good treatment.

Is it possible that Elizabeth was aware of the poor quality of her levied men and was also aware that, come what may, these towns were to be her fall back financially? ^{5.50}

As Edward Norreys, one of the three Norreys brothers in the campaign, reported to the Privy Council 'everything was so dear that the men were hardly able to spare anything for clothes especially as they had to pay ready money for all they bought'. ^{5.51} Huddiston was the first Treasurer at War and was instructed to carry money to Middelburg, the provincial capital and close to Flushing and to pay in local currency at the best rate available. ^{5.52}

It would have been expected that the authorities at Middelburg in Zeeland would have gone out of their way to provide succour to the soldiers who were there to defend their interests and to maintain the trade between England and the Dutch. The rush of refugees to Middelburg and to Amsterdam is shown by the registration of 1,000 new burgers in Middelburg in the years 1585 to 1590 who were competing with the military for food and lodgings (figure 10). This competition remained as Sir Henry Norreys kept five companies at Flushing and its accompanying fort Rammekens for duties and a further three companies at Brill throughout the campaign. ^{5.53}

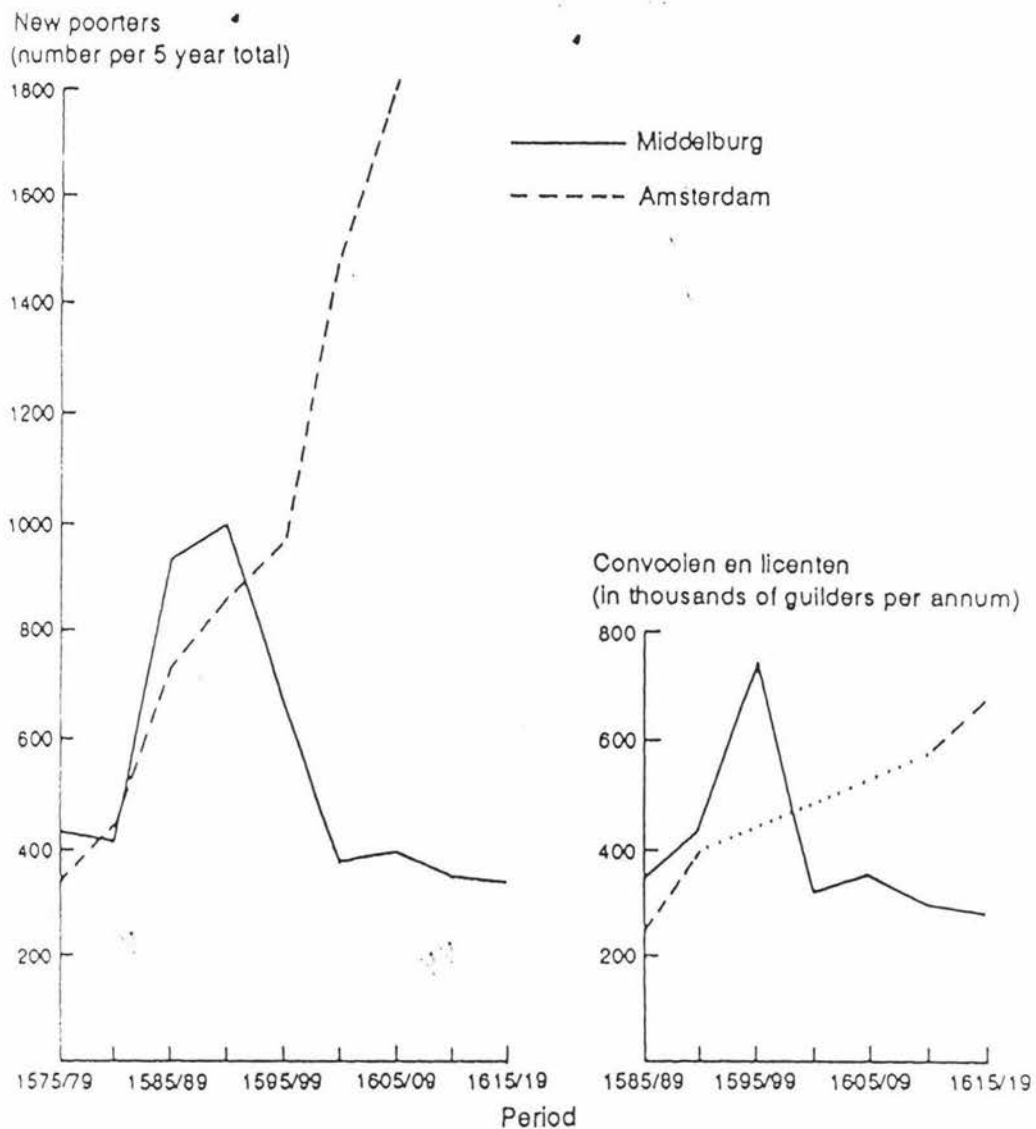


Figure 9.2. Two indicators of the growth of Amsterdam and Middelburg, 1575–1619. New burgers (*poorters*) enrolled in Amsterdam and Middelburg – an indicator of the attractive power of the cities to relatively well-off migrants. [J. G. van Dillen, *Bronnen tot de geschiedenis van het bedrijfsleven en het gildwezen van Amsterdam, 1512–1611*, R. P. G., Grote serie 69 (The Hague, 1929), p. xxiv. *Convoeien en licenten* revenue – a rough measure of the foreign trade of these port cities. [Marjolein 't Hart, *In Quest of Funds* (Leiden, 1989), Appendix III.]

Figure 10 Graphs of foreign trade, Amsterdam and Middelburg to mid-seventeen century. From 'The First Modern Economy', de Vries and Woude, p.367

The morale of this first group of soldiers in 1585 must have been very low. They were ill, seasick, hungry, unpaid and poorly clothed facing the harsh winter in Zeeland, a maritime province, subject to fierce winter gales.

Would the conscripted men be aware of the competence of their military leaders and indeed what were the objectives of the campaign? The recruits were compelled to swear oaths of fidelity to the Queen and to her officers but may not then have been informed of their ultimate destination. Because of the turmoil that occurred all over England in the parishes during the previous generation, it is likely that even the most backward of rural areas would be somewhat in touch with national matters. There had been changes in religious teachings, the destruction of the monasteries had occurred and the controversy of the marriage of Mary Tudor to Philip of Spain would have been widely discussed. Those who dwelt in the wool-growing areas are likely to have known of the name of the wool-staple town of Antwerp.

Earlier the military activities of Henry the Eighth and his preparation of the coastal fortifications with Martello Towers required a large labour force who in turn probably came from adjacent rural areas would have alerted the population to anxieties relating to the nation. The failure of the French naval raid on the Portsmouth and the Isle of Wight in July 1545, could not have been unknown. The requirement to be part of the militia would lead to the men questioning the military purpose of the training particularly if they were introduced to the use of firearms. However other than to sailors and veterans, it is likely that they knew little about the Netherlands and what the climate and geography would be.

The fact that their overall leader Robert Dudley, the Earl of Leicester, was to come to Zeeland later after their arrival may have raised their hope that conditions would improve. The alleged attachment of the Earl of Leicester to the Queen may have been common market-place gossip, but again may have raised hopes that his influence would improve their lot. But was their hope misplaced? What military experience was Leicester bringing with him? As it happens, very little. John Dudley, his father, was recognized as a great soldier

and as a military leader who had enjoyed a great reputation as a soldier and tried leader, but was his son? Certainly the senior officers and captains would have been aware of his lack of military experience.

Robert Dudley, the leader for the Flanders campaign, first saw major military action when England was in a difficult state due to money debasement by Henry the Eighth. There were poor harvests, starvation and unemployment. It must be wondered over the years how many of the recruits for military service were driven to it as an alternative to starvation. Civil uprisings were breaking out during 1549, none more so than that in Norwich led by Robert Kett.^{5.54} The Marquis of Northampton and others were sent to quell the rising of men who were bitter and desperate. Kett eventually had a force of 12,000 rebels. John Dudley eventually was called upon to make things right after the failure of Northampton to do so.^{5.55} He eventually had a force of about 10,000 men and a few cannons. The men mostly were scantily trained levies but were reinforced by a hard core of veterans and mercenaries. Later in the fight another 1,100 German mercenaries arrived to fight and were merciless in suppressing the rebels.

Robert Dudley should have been learning many lessons appropriate to his later Flanders expedition. John Dudley was said to have been chivalrous but 'this chivalrous panache was a quality that Robert inherited from his father in full measure without unfortunately the military brilliance to go with it.'^{5.56} It cannot have escaped the minds of John Dudley and Robert how inefficient the troops' mobilization system was in emergency times. It must be assumed that there were medical practitioners with the 10,000 men and they were probably members of the retinue of the nobles involved in the conflict. Under the ordinances of the Barber-Surgeons Company they would have been required to provide surgeons but the annals show no record of any request for them.^{5.57}

Leicester's officers would be hard pressed to ignore his dubious loyalty in pre-Elizabethan times as he made every effort to ingratiate himself for his own benefit with Mary's regime. He was said to be a strong anti-Marian supporter and he had been selected on the death of Edward the Sixth to pursue Mary

with troops to be raised from his own Norfolk estates. He missed her, and he was said to be 'tired, worried and angry' and it would seem without much justification burnt down Swanston Hall, which was regarded at the time as being very foolish.^{5.58} He was said to have a 'bitterness and loathing for the religion espoused by Mary and her Bishop Gardiner her Lord Chancellor'. Between 1555 and 1558, three hundred Protestant men and women had been executed on the results of 'examination ' by Mary's bishops.^{5.59} John Dudley may have developed some sympathy for Dutch as part of his general bitterness about Mary's actions. This may have passed on to his son Robert who pushed very hard in Council for an aggressive policy and military action to aid the Protestants abroad.^{5.60}

Between 1555 and 1557 he is said to have made many friends with the Spaniards in London, and to have commended himself as a military commander to Philip.^{5.61} Notwithstanding his anti-Marian protestations, he accompanied Philip on his tour of the Netherlands in September 1555 and was trusted by Philip as a message carrier to the English ambassadors in various areas in Europe.^{5.62} Philip wanted Mary to raise an army to resist the French but for a time the Privy Council would not agree.

Robert Dudley suggested to Mary 'give me back my lands and I will raise troops' for Philip. These lands had been confiscated from his father John during the period of his disgrace. In early 1556 Philip returned to the Netherlands with an English army of 6,000 men under the command of the Earl of Pembroke. The army surrounded St. Quentin, eighty miles from Paris on the Somme. Robert Dudley was master of ordinance with the army. St Quentin was taken and Robert would have been witness to the enormous slaughter carried out by Philip's mercenaries the infamous German 'Swartzrotters'. He had known of their barbarity during the Kett affair.

In March 1557, Leicester had acted as a go-between for Philip and Mary.^{5.63} Following the conclusion of the St. Quentin affair, Robert Dudley retired to his estates in Norfolk and gave no further service to Mary. With time the French recaptured St. Quentin and Calais was besieged. His officers in

Flanders would also be aware of the scandal surrounding the mysterious death of Robert Dudley's young wife Amy Robsart,^{5.64} Leicester's enemies suggested she was murdered to allow him to become a serious suitor for Elizabeth's hand in marriage. He was also in the army at Newhaven (Le Havre) and Dieppe in October 1563/64 under the command of Ambrose Dudley, Robert's brother.^{5.65} The campaign was a failure; it would seem in part due to Elizabeth's meanness or inability to provide sufficient funds to allow adequate defences to be constructed.^{5.66}

Leicester may have appeared to his commanders to have very little military experience and to be a self-seeking survivor of the Marian times, given to rash decisions, who could be a potential turn-coat to gain his advancement. However he was described as being 'a devoted Protestant, patron of scholars, clergy, actors, authors and artists; to have encouraged sciences and philosophical enquiry but studied very little'^{5.67}. He had pushed hard in the Privy Council to become the leader of the Flanders expedition, mostly to restore his flagging reputation at court following multiple scandalous flirtations. Elizabeth is said to have agreed to his appointment reluctantly.^{5.68}

Leicester's reputation among his officers and to the soldiers would be certainly even less when the circumstances of this journey to the Netherlands became common knowledge rapidly spreading by word of mouth at Flushing. Leicester left England on 8 December 1585 with a fleet of one hundred vessels under the command of Stephen Borough (some say William Burrows).^{5.69} Borough heard with surprise that Leicester intended to land at Brill, which in mid-winter would have been unsuitable and would not accommodate the fleet. The sailor made it clear to Leicester that Flushing was the suitable destination, Leicester refused to concede the point to the experienced sailor who knew what he was doing. Eventually many other pilots prevailed upon Leicester to change his mind, which he did eventually at noon. He showed himself 'unfit to command'.^{5.70} From the fleet, a small group of ships were sent to Brill. On 10 December 1585 he arrived at Flushing and was greeted there by the governor Sir Philip Sidney. How humiliating for the new Governor-General and for the English expedition if he had arrived at the

wrong place. How could he have been so ignorant? He had been in the Netherlands before and surely should have had some understanding of the geography or at least become better informed. Although Brill is geographically only a few miles from Flushing, the state of the roads in early winter would have been almost impassable for any large group of carriages and men. There was no direct contact by canal and the shallow waters off the coast in this area was subject to sudden turbulence, and would never have been suitable for a command centre being away from the strategic area of the mouth of the Schelde river.

Leicester had a personal retinue of ninety nine gentlemen and yeoman officers, together with their servants, ranging from his steward, secretary, chaplains, cooks, grooms and farrier, his musicians and his troupe of actors, and his other companions, twenty two lords, knights and gentlemen with their fifty retainers.^{5.71}

Representatives were present from many principal cities in the Netherlands that were able to give loyalty to Orange. Banners, arches, and a fete were organized and a cannon salute fired in his honour. Elizabeth had declared that she was not trying to deprive Spain of the territories but 'when the cities were protected against sack and desolation, she would withdraw her troops, she had come into the struggle as an aiding friend.'^{5.72} The tone of this comment would have done little to reassure the loyal forces assembled at Flushing but may have consoled the merchants and citizens of Zeeland and Holland.

Overall, the initial forces for the Flanders campaign were made up of the poorest men in the levy. They were poorly equipped in arms and clothing, in bad health, and without money. His commanders would know about his stubbornness and his lack of skill in military affairs, which would soon be shown when he argued tactics with Sir John Norreys a professional soldier who had campaigned in the area with distinction previously.^{5.73}

It can be seen that a medical practitioner could be any person who could convince the levying body that they possessed 'healing powers'. Medical practitioners were not excluded from the general levy although the Barber-Surgeons Company was allowed some leeway but only after considerable lobbying of the Government. The initial men sent to Flanders were poorly trained and probably among the most unfit for service, they were recruited on with the desire that the best should be kept at home in England. There was widespread fraud at all levels with the ultimate effect that the troops were not paid and often reduced to starvation. The levy concept at times was not adequate and some captains were allowed to recruit their own surgeons. There appears to have been disquiet about the ability of the leaders and of Leicester in particular. It must be assumed that the worries about the competency of the leader would have been transmitted to the troops and when coupled with their mean state of living would lower their morale even further.

REFERENCES

- ^{5.1} Young, S. *Annals of the Barber-Surgeons*, (Blades, East & Blades, London, 1890), pps. 99-100.
- ^{5.2} *Ibid.* p.102
- ^{5.3} Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p. 137
- ^{5.4} Guy, John. *Tudor England*, (Oxford University Press, Oxford, 1988), p.246 also p.348
- ^{5.5} Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p. 137
- ^{5.6} Young, S. *Annals of the Barber-Surgeons*, (Blades, East & Blades, London, 1890), p.107
- ^{5.7} Pelling, M. and Webster, C. 'Medical Practitioners' *Health, Medicine and Mortality in the Sixteenth Century*, (Cambridge University Press, Cambridge, 1979), p.188
- ^{5.8} *Ibid.* p.223
- ^{5.9} *Ibid.* p.212
- ^{5.10} *Ibid.* p.224
- ^{5.11} *Ibid.* p.226
- ^{5.12} *Ibid.* p.235
- ^{5.13} Guy, John. *Tudor England*, (Oxford University Press, Oxford, 1988), p.32
- ^{5.14} Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p.6
- ^{5.15} Beckett, I.F.W. *The Amateur Military Tradition, 1558-1945*, (Manchester University Press, Manchester.1991), p.26.
- ^{5.16} Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p. 6
- ^{5.17} Barthrop, M. *The Armies of Britain*, (National Army Museum Press, London, 1980). p. 16
- ^{5.18} Beckett, I.F.W. *The Amateur Military Tradition, 1558-1945*, (Manchester University Press, Manchester, 1991), p.23
- ^{5.19} Guy, John. *Tudor England*, (Oxford University Press, Oxford, 1988), p.340
- ^{5.20} Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p. 8
- ^{5.21} Beckett, I.F.W. *The Amateur Military Tradition, 1558-1945*, (Manchester University Press, Manchester, 1991.), p.26.
- ^{5.22} Guy, John. *Tudor England*, (Oxford University Press, Oxford, 1988), p.458
- ^{5.23} Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p. 138
- ^{5.24} *Ibid.* p. 1

- 5.25 Barthrop, M. *The Armies of Britain*, (National Army Museum Press, London, 1980). p. 16
- 5.26 Ibid. p. 16
- 5.27 Beckett I.F.W. *The Amateur Military Tradition, 1558-1945*, (Manchester University Press, Manchester. 1991), p.25
- 5.28 Ibid. p. 16
- 5.29 Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946) .p.6
- 5.30 Ibid. p. 9
- 5.31 Motley, J.L. *The United Netherlands*, John Murray, London, 1869, p. 392
- 5.32 Ibid. p. 155
- 5.33 Ibid. p. 38
- 5.34 *Acts of The Privy Council, Preface*, New Series, (H.M.Stationary Office, London. 1897), 14.26
- 5.35 Ibid. p. 14.75
- 5.36 Motley J.L. *The United Netherlands*, John Murray, London, 1869, p. 392
- 5.37 Ibid p. 392
- 5.38 Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p. 23
- 5.39 Ibid.p. 71
- 5.40 Ibid.p.141
- 5.41 Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p. 75
- 5.42 Ibid. p. 30
- 5.43 Ibid. p. 74
- 5.44 Ibid.p.108
- 5.45 Williams, Sir Roger. *The Actions of the Low Countries*, London, 1618, p.69.
- 5.46 Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p. 109
- 5.47 Ibid. p. 116
- 5.48 Ibid p.15
- 5.49 *Calender of State Papers, (Foreign Series, Elizabeth)*, (Public Record Office, London. Ed. S.C.Lomas, 1921) 20:41
- 5.50 Ibid.20:57/58.
- 5.51 *Acts of The Privy Council, Preface*, New Series, (H.M.Stationary Office, London,1897), p. 103 also Cruickshank, C.G. *Elizabeth's Army*, Oxford University Press, London, 1946). p. 29.
- 5.52 Ibid. p. 103
- 5.53 Ibid. p. 97
- 5.54 Wilson, Derek. *Sweet Robin*, (Hamish Hamilton, London, 1981). p. 31.
- 5.55 Ibid. p.31-36
- 5.56 Ibid. p. 35
- 5.57 Young, S. *Annals of the Barber-Surgeons*, (Blades, East & Blades, London,1890), p.99
- 5.58 Wilson, Derek. *Sweet Robin*, (Hamish Hamilton, London, 1981), p.57
- 5.59 Ibid.p.76
- 5.60 *History Today, Companion to British History*, (Collins & Brown, London, 1995), p.249
- 5.61 Wilson, Derek. *Sweet Robin*, (Hamish Hamilton, London, 1981). p. 75
- 5.62 Ibid.p.71
- 5.63 Ibid.p.71
- 5.64 Ibid.p.118
- 5.65 Ibid.p.135
- 5.66 Ibid.p.136
- 5.67 Ibid.p.81
- 5.68 *History Today, Companion to British History*, (Collins & Brown, London, 1995), p.249
- 5.69 Wilson, Derek. *Sweet Robin*, (Hamish Hamilton, London, 1981), p.275
- 5.70 Jenkins, E. *Elizabeth and Leicester*, (Victor Gollance Ltd. London, 1961). p.306
- 5.71 Wilson, Derek. *Sweet Robin*, (Hamish Hamilton, London, 1981), p.275
- 5.72 Jenkins, E. *Elizabeth and Leicester*, (Victor Gollance Ltd. London, 1961). p.308
- 5.73 *Acts of The Privy Council, Preface*. New Series, (H.M.Stationary Office, London, 1897),15.13

CHAPTER 6

WILLIAM CLOWES, SENIOR MILITARY SURGEON

William Clowes was delegated to be the surgeon to Leicester by specific request of the Queen.^{6.1} He was possibly the most informed man on military medicine in England. His medical background was profoundly involved in military matters. At the age of nineteen, he served as surgeon in Warwick's expedition to Le Havre although not a licensed surgeon. From 1564 to 1570 he served as a naval surgeon at Portsmouth, during this time he gained great skills and experience in the ailments of the common sailor particularly in the area of venereal disease and syphilis about which he wrote in later publications. Cruickshank and other authors refer to William Clowes (c.1540-1604) as being the outstanding surgeon in the matters of military medicines.^{6.2} Clowes was admitted to the freedom of the Barber-Surgeons on 7 May 1563, and in the same year served in the army under the Earl of Warwick at Le Havre. He was then only twenty three years old.

His reputation must have been well recognized as he was appointed to serve on the 'Aide', an escort vessel escorting the Emperor Maximilian the Second's daughter, Ann, through the Channel to marry Philip the Second of Spain in 1577. He described during his experiences, the removal of a splinter of bone from the lung of a boatswain whose ribs had been fractured with full recovery within ten days. Lung and chest injuries were usually fatal at this time, so such a surgical 'cure' of this type would be well worth noting. Subsequently he was employed in the 'hospitals in London', until March 1576 and was employed as one of the surgeons at St. Bartholomew's Hospital at a salary of £20 per year. In 1576, he also was attending to sick children at Christ's Hospital as an apothecary-surgeon. In 1580, Clowes was granted a Bishop's license to practice at the direct request of the Queen. It was stated that he enjoyed harmonious relationships within his hospital appointments. This was certainly not the case within the Company of Barber-Surgeons as he was subjected to many complaints by both patients and his colleagues. Clowes rose to be Middle Warden of the Company in 1584, but was never

elevated to Master. In 1588 he was taken into the governing body of the Company. He resigned from his hospital duties in March 1585 and took up his appointment with Leicester, with whom he served for nine months in Flanders. Appointed with him to Flanders was Master Godorus, Sergeant-Surgeon to her majesty.^{6.3} When he joined Leicester in Flanders, he was ordered by him to attend to 'curing of the hurt and wounded soldiers'^{6.4} He continued to laud his skills by stating that 'there was not one of the patients that did at any time complain of any pain or grief, by reason of the application of our remedies'. Clowes did qualify his success by admitting that the wounds were of the flesh and not serious.^{6.5}

Clowes suggested to his readers that a powder advocated by Gale was helpful in stopping 'great flux' of blood. The mixture contained aluminum, thuris, arsenic and a calcium salt.^{6.6} He outlined another ointment devised and used by Paré. Clowes had contact with John James as a surgeon at Utrecht where James had recommended an oil to him.^{6.7} It is possible that there may have been other surgeons who had knowledge of the conditions in Flanders, perhaps having previously studied at Leyden. The university was popular with English students. Some measure of this can be seen in that three of nine Fellows recruited to the College of Physicians between 1585 to 1589 came from Leyden. The flow of medical students to Leyden during these years may have allowed access to another group suitable to act in the army as surgeons.^{6.8} It was common for medical students to be practicing before graduation.^{6.9}

Clowes' status as a favorite of the Queen is clear from his appointment as Surgeon to the Fleet and one of the Queen's Surgeons through the Queen's 'favour and good liking'. He served on the Ark Royal during the Armada campaign.

As a naval surgeon from 1564 to 1570, Clowes described accurately the clinical findings of scurvy, which he called scorby and he correctly stated that it was related to the poor diet of the sailors. He advocated the use of fresh fruit, vegetables, watercress and 'scurvy grass' for its cure. In two clinical cases, among other dietary materials he used 'berijuce made of grapes'. It is

quite possible that this juice was responsible for sufficient Vitamin C to cure scurvy as he claimed ^{6.10} Dealing with the diet on sea journeys he advocated among other items 'lettuce, purslane (a succulent), borage, bugleaf, spinach and such like herbs'. Notably these are all green vegetables. ^{6.11}

Guillemeau in 1594 advocated tying arteries to reduce blood loss during amputation. Clowes was the first surgeon to adopt the practice in England. ^{6.12} In his book of 1596, he describes an amputation of the lower limb in some detail and advocated 'bands' around the limb and stated clearly that it was not good to lose blood. ^{6.13} He was lavish in his praise of Ambroise Paré when he was describing about this same case by calling him 'a man of great knowledge' and stating that Paré had advocated that the flesh be sewn over the stump in the shape of an X.

Throughout his career it appears that Clowes was anxious to raise the standards of surgical practice and was highly critical of the practices of some of his colleagues.

William Clowes, best known for his military writings particularly his 1588 classic 'Prooved practice for all young chiruigians, concerning burnings with gunpowder', was quite prolific in other medical matters. He wrote 'A Brief and Necessary Treatise of Morbus Gallicus' in 1585, and in 1596:

A Brief and Necessary Treatise, Touching the Cure of the Disease now usually called Lues Venerea by unctions and approved ways of curing, newly corrected and augmented in the year of the Lord, 1596.

The change in title is in itself instructive. The title is changed from Morbus Gallicus to Lues Venerum, which was probably more politically correct as England was becoming somewhat an ally of France (specifically for Henry of Navarre) between 1589 and 1595. ^{6.14} It would have been unwise for Clowes as one of Elizabeth's military 'advisors' to denigrate France by using the title Morbus Gallicus. As Clowes used the word cure, it suggests that he was

recognizing, that despite its hazards, some success was occurring with mercury therapy.^{6.15}

In 1602 Clowes published another text 'A Right Fruitful Treatise for the Artificial Cure of Struma'. In this text he gave vent to his dislike of unauthorized practitioners and such like describing them as,

Beastlie abusers of physicke and chirurgerie, tinkers, tooth-drawers, pedlars, ostlers, carters, porters, horse-gelders and horse-leeches, idiots, apple-squires, broom men, bawds, witches, conjurers, sooth sayers and sow-gelders, rogues and ratcatchers, renegades and proctors of spittle-houses, with such rotten and stinking weeds, which do in country, without order, honesty and skill daily abuse both physic and chirurgery, having no more perserverance, reason or knowledge in this art than hath a goose,.....and this is one principal cause that so many perish

English military medicine seems not to have been influenced by the slow but progressive alteration of general medical thinking, if the published texts are a guide. The bulk of the medical personnel in the military appear to have come from the ranks of the barber-surgeons and unlicensed practitioners, most of whom were unlikely to have studied on the Continent or been able to have access to the few texts available. Those who had had the opportunity to influence the military surgeons appear not to have done so. Thus the foremost military physician to Queen Elizabeth, William Clowes, while giving advice to young physicians entering military service in 1591 did not advocate changed approaches in treatment for wounds and burns. Only his later text in 1596, showed changes and he was not among the very early advocates of Paracelsianism in England.^{6.16} Equally he may be criticized for not taking up the change in thought earlier as advocated by the brilliant French military surgeon Paré. There may have been friction if he had done so as the Company of Barber-Surgeons was subject to the overall policies as advocated by the College of Physicians.

Clowes published several treatises on various illnesses as we have seen. In 1585 he published 'A Briefe and Necessarie Treatise of Moribus Gallicus'. In 1588, Clowes wrote 'Prooved Practice for all young Chirugians, concerning Burnings with Gunpowder'.^{6.17} Cruickshank in 'Elizabeth's Army' states that this text was published in 1591 but this was the republished version that was printed in London by Thomas Orwyn for Thomas Cadman.^{6.18} There was a later similar text published in 1596:

A profitable and necessarie booke of observations, for all those that are burned with the flame of gunpowder and the curing of wounds made by musket and caliver shot and other weapons of war.

Clowes was a lecturer at the Company of Barber-Surgeons but there is no record to state that he was teaching the Paracelsian approach nor the groundbreaking concepts of the French surgeon, Ambroise Paré who he twice refers to as a master in 1591.^{6.19} There seems to be little attempt by Clowes to advocate Paré's approach to the treatment of wounds at that time although by 1596 he was frequently referring to Paré and his teachings in his text. He does refer to using a 'chokeband' or tourniquet during an amputation as advocated by Paré.

However Clowes claimed to have a perfect record of healing those who had the 'slightest chance of recovery'. In his military writing as the senior surgeon appointed to Elizabeth's army, he deferred his therapeutics to the will of God.^{6.20} In his 1596 publication, he outlined many clinical cases and gave advice about the remedies he employed. He warned that untrained persons should not stir gunpowder with their hands. It must be assumed that he had seen hand burns when unclean hands handled fire.

As early as the campaign by Henry the Fifth's army the men knew that an abdominal wound was a death sentence, invariably fatal due to the onset of peritonitis.^{6.21} and such knowledge would have permeated to the armies of later years. The understanding that such a wound was a death sentence possibly prompted William Clowes to state that he had cured a soldier with an

abdominal wound although in all probability the wound was no more than a muscle wound and had not penetrated the abdominal cavity.

William Clowes may be criticized, as he knew that better surgical practice could be given within the army. He certainly wrote about his contempt for the unlicensed practitioners. Why then did he not bring more pressure to bear on the Government to improve standards? Possibly any moves would be futile, as there were no training opportunities to offer the general 'practitioner'. He may have felt that his influence as senior surgeon appointed by the Queen to Leicester and hence to the army of Flanders would be better spent in influencing the whole process of medical education through his surgical texts.

REFERENCES

- ^{6.1} Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p. 121
- ^{6.2} *Ibid.* p. 121
- ^{6.3} Clowes, W. *Prooved Practice for All Young Chirurigans, Concerning Burnings With Gunpowder* London, 1596 p.111
- ^{6.4} *Ibid.* p.111
- ^{6.5} *Ibid.* p.110
- ^{6.6} *Ibid.* p.135
- ^{6.7} *Ibid.* p.111
- ^{6.8} Pelling, M. and Webster, C. 'Medical Practitioners' *Health, Medicine and Mortality in the Sixteenth Century*, (Cambridge University Press, Cambridge, 1979), p.191
- ^{6.9} *Ibid.* p 192
- ^{6.10} Clowes, W. *Prooved Practice for All Young Chirurigans, Concerning Burnings With Gunpowder*, London, 1596.p. 41
- ^{6.11} *Ibid.* p. 102
- ^{6.12} *Oxford Dictionary of National Biography*, (Oxford University Press, Oxford, 2004) 12:216-218.
- ^{6.13} Clowes, W. *Prooved Practice for All Young Chirurigans, Concerning Burnings With Gunpowder*, London, 1596.p.96
- ^{6.14} Guy, John. *Tudor England*, (Oxford University Press, Oxford, 1988), p.343
- ^{6.15} Reed, C. S. The Codpiece: Social Fashion or Medical Need?' *Internal Medical Journal*, (Blackwell Publishing, Melbourne, 2004).34:684-686.
- ^{6.16} Clowes, W. *Prooved Practice for All Young Chirurigans, Concerning Burnings With Gunpowder*, London. 1591.
- ^{6.17} Clowes, W. *Prooved Practice for All Young Chirurigans, Concerning Burnings With Gunpowder*, London, 1596.
- ^{6.18} Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946), p.121
- ^{6.19} Paré, Thomas. *The Works of Ambroise Paré*, (Cornhill, London 1611).
- ^{6.20} Clowes, W. *Prooved Practice for All Young Chirurigans, Concerning Burnings With Gunpowder*, London, 1596.
- ^{6.21} Keegan, J. *The Face of Battle*, (Jonathon Cape, London). 1976

CHAPTER 7

THE MEDICAL PRACTITIONER IN THE FIELD IN FLANDERS.

The status of the surgeon in the recruiting warrants showed a scale of pay, which was coupled to that of the drummers. Gale ^{7.1} (1507-1587) pointed out to Elizabeth that such low pay would attract the poorest standard of men, who he went on to describe in many cases to be little better than 'sow gelders, tinkers and cobblers.' However this could not be true of all the medical practitioners in the Flanders force; perhaps Gale had been out of touch with the 'common scene' and did not understand that the common man was used to very little skill in his own home environment. As has been outlined previously, the military of England may have seen no difference from the advice to which they had become accustomed depending upon their place of recruitment and their class in society.

Initially the surgeon's pay was one shilling per day but later in the campaign the pay recommendation changed to two surgeons for each regiment of ten companies being paid five shillings per day, from which each was expected to pay for assistants.^{7.2} The average fee for a physician in Elizabeth's England was one mark (thirteen shillings and four pence). The Queen's apothecary was paid about £100 for a quarter.^{7.3} A scale of pay at this level would offer very little monetary incentive for army service.

What would be the appearance of a military field practitioner in the Flanders army? There are very few illustrations of the appearance of medical practitioners in the sixteenth century. The recognized leaders in military matters in the early sixteenth century were the Swiss and the Germans.^{7.4} There is a woodcut from 1535 by Erhard Schoen of a field surgeon of Swiss-German forces, (figure 11).^{7.5} The nature of his clothing is of less concern than the illustration of the items which he had with him. The surgeon carried a bag similar in shape to the traditional 'Gladstone' bag as seen in Victorian cartoons of surgeons. He had a number of instruments^{7.6} the use of which



Figure 11 'The field surgeon' by E. Schoen

would be familiar to surgeons today. He had knives, saws, splints, a bowl and a sponge.

There appears to be a knapsack on his back. Between the legs of his soldier-patient is the representation of an herb. He has numerous finely crafted pots with lids. This type of stoneware was mainly manufactured in the Rhineland in the area of Raeren^{7.7} and was not available in England. It was imported from Holland and in 1593 Henry Noell was granted a fifteen year monopoly to import these pots. They were highly prized by the Tudor nobility as beer and wine vessels and often carried their possessor's arms engraved upon them as in the illustration.

In 1585, Clowes was appointed by the Queen to go to the Low Countries, to attend upon the Earl of Leicester, Captain-General of her forces. Others to serve in the Netherlands were Sergeant-Surgeon Gooderus and Robert Balthrop, who was Sergeant-Surgeon to Queen Elizabeth from 1562 to 1591.^{7.8} It is noted that on 20 February 1567, Henry Smith, a Yeoman in the service of the Earl of Leicester, had been admitted to the Company, evidently without the required apprenticeship.^{7.9} Could there have been some inducements offered by Leicester?

Paré (1510-1590) joined the French Army as a field surgeon in 1537 after completing his apprenticeship in 1536. In Milan, during one of the early campaigns of Francis the Second of France into Italy, he had no oil with which to cauterize wounds. It may be said that he conducted one of the first truly controlled clinical trials. He had a group of casualties whose wounds were treated with the conventional boiling oil and those who received only dressings and an ointment of egg yolk, rose water and turpentine. The results from the conservative practice were dramatic with better survival and comfort of the wounded. This remarkable man advocated tying major bleeding arteries and swift amputations.^c Paré advocated that there was no need to probe for

^c Paré was the first surgeon to successfully amputate live limbs above a wound, showing some understanding that arterial blood pumped from above the wound. Wangenstein, *Bulletin of the History of Medicine*, 46:3:207-234, 1973.

lead bullets ^{7.10}, which could be left untouched in the muscles, but iron, and other metals may corrode and would be better removed.

Paré developed artificial limbs and even manufactured false eyes. He attempted to treat fractures of the neck of the femur, recognized stangury caused by hypertrophy of the prostate and involved syphilis in the aetiology of aneurysms. He advocated a paste of onions and salt to be applied to wounds, possibly this would generate a saline cover.^{7.11} Paré published his works in 1582 and although he lectured at the Paris Faculty of Medicine, the faculty vigorously opposed his concepts about wound treatment.

It must be assumed that the Barber-Surgeons knew that Paré had been teaching different methods of wound treatment in Paris and just as with Paracelsus, it is likely that the 'trickle down' of information occurred. But how could the new approaches be implemented when the teaching institutions of England were overseen by the College of Physicians that was staunchly conservative and the key changes being advocated were in alchemy and chemical therapies? These advances of Paré had to be digested within the philosophical debates of the College.

Included in the text by Clowes in his 'proved practice' is a formula for a dressing solution for gunpowder wounds. It is composed of thirteen herbs, flowers, ferns and roots. The botanical names are given but there are now so many species bearing the same genus name that no one item can be identified. They do however seem to be harmless and some ingredients may have actually assisted. The use of extracts from *Coniftrales* (*conifers*) may have had a role as a haemostatic. *Calendula* (marigold) contains an essential oil and a gum and *Coffichelidonium* (*papaveracea spp.*) produces a yellow latex-like substance. Possibly the latter two items could congeal to form a 'plastic skin' which could have been the first attempt to act in this manner and in keeping with current practice.

Clowes recommended advice for the treatment of the wounds was follows, On the third day open the wound and found it without pain, or

any other evil accident: then still in ad bone, fomented and baathe the wound with this bjink, which is of my collection, let the herbs lie in the wine and after a space of falver (seven) daises, and after boiled in Balneo Water, (probably a salt bath).

Clowes advocated that the young surgeon should know about diet and purges, he should have unguents and liniments. He suggested a supply of calomel, mercury sublimate, mercurii precipitate, lalumen roche, vitriolium, tereb in thinea, lead, myrrh, mummy, aloes, gum arabic, eggs and vinegar. It is perhaps a reflection on the poor military medicine in the English army that Clowes does not list any anaesthetic materials. Certainly laudanum was known about from Paracelsus who may not have appreciated its painkilling properties. The use of mandrake and 'spongia somnifera' was not recommended by him.^{7.12} There is one reference to Clowes advocating laudni as one part of a mixture of many items.^{7.13} This may or may not have been laudenum but if so then he did not advocate its use among the multiple other materials. He was free in the use of terebinth (turpentine), camphor, sulphur, egg white, licorice, mithredatum and treacle.

Clowes dealt with the various types of diet and of purging. He outlined the use of exemplars including unguents and of liniments (oleum). Clowes also advised that the medical kit should include other needy things: - Capping (cupping) and boring glasses and a chaffing 'bitt'. A mortar and 'pessile'. Infusing of ingredients in vinegar or wine was commonplace and had the advantage that the fluid was likely to be sterile due to the methods of manufacture.

Tapes for binding splints, mortars and pestle, cups and boring glasses and a chaffing bit were recommended to be in a surgeon's kit. Examination of illustrations in Clowes' text shows his surgical instruments, which suggests that very skilled workmanship was available from the instrument makers. The instruments included a brace and bit, curved scissors, small saws, a screw clamp with four blades, a syringe, various knives and grasping instruments.

He listed burning irons to be taken but in his case notes, he did not say that he had used cautery on any patient.

When dealing with the physical dressing of burns, Clowes suggested that the blisters should not be opened and that a mixture of egg white (albumin) milk (lactus muliebris) and camphor could be used.^{7.14} He also advocated a more complicated mixture for dressing of gunpowder wounds.^{7.15} Clowes showed great faith in his prescriptions saying about the effect of the application of one of his ointments that it was 'very good for burnings with gunpowder or skalding with water, and it healed without ulceration or paine, and drieth very well, and it bringeth againe the beauty of the skin'. Clinically he was well aware that deep ulceration could occur from severe burns.

The composition of one of his main remedies is as follows:

Vini Alb Lib Viii	Vinegar
Aquae Com Lib X	Water
Sacchari Alba lib 11	Sugar
Confolide Vtriufque	probably from Coniftrales,(Conifers) plants and needles, it may have a role in lessening haemorrhage.
Filicis Aquaticae	Filipendula hexapetala (Dropwort) Roots Flowers and leaves extensively used in 16 th /17 th Centuries to treat kidney and bladder stones, for epilepsy, dropsy, genital discharges and topically for coughs
Calen Dulae	Probably Calendula = Marigold, contains an essential oil, also a gum, used to aid digestion, home remedy against jaundice and intestinal worms.
Ophiogloffii	O. vulgatum, 'Adder's tongue' is a fern, a poultice may be made which is helpful to 'cure' ulcers.
Chelidonj	Coffichelidonium, Part of the Papaveracea species. A yellow latex, used for skin

	complaints and orally a diuretic, expectorant, purgative and sedative
Polipodiiquercini	Genus of ferns. probably from a Spanish origin. Used in respiratory disease
Numulariae	Numularia, Aquiplants, Moneywort. 'Creeping Jenny', close relative of yellow pimpernel. Said to be a good vulnerary or wound herb, leaves were crushed and applied externally.
Lilii Conuallium	There are 80 spp. of lily mostly of Japanese or Chinese origin. In Europe, the <i>L. longiflorum</i> 's flowers yield a perfume.
Sanimuni	This probably refers to <i>Sanicula</i> , of which 37 Varieties are recognized today. They have an astringent derived from the leaves, and a liquid also used for stomach and lung diseases.
Diapenfae	There is no listing under this genus but it Probably refers to the diphenfae, these are Medicines having the properties of inducing perspiration and hence lowering fever. First mentioned by T.Gale in 1563 for this use. In 1601, Holland quotes Pliny 11.341. as advocating the ashes of goat's horn incorporated into an unguent with oil of myrtle, for diaphoretic sweats for those who have it applied. ^{ox}
Veronicae	300 species. Used for antidiarrhoeals and as laxatives
Verbenae (? Officinalis)	250 species, 'Holy Wort' used as poultice for skin and ulcers
Pimpinellae	150 species, possibly <i>P. anisium</i> , seeds for stomach upsets, also used for Oil of Anise distilled from the seeds for the same purpose.

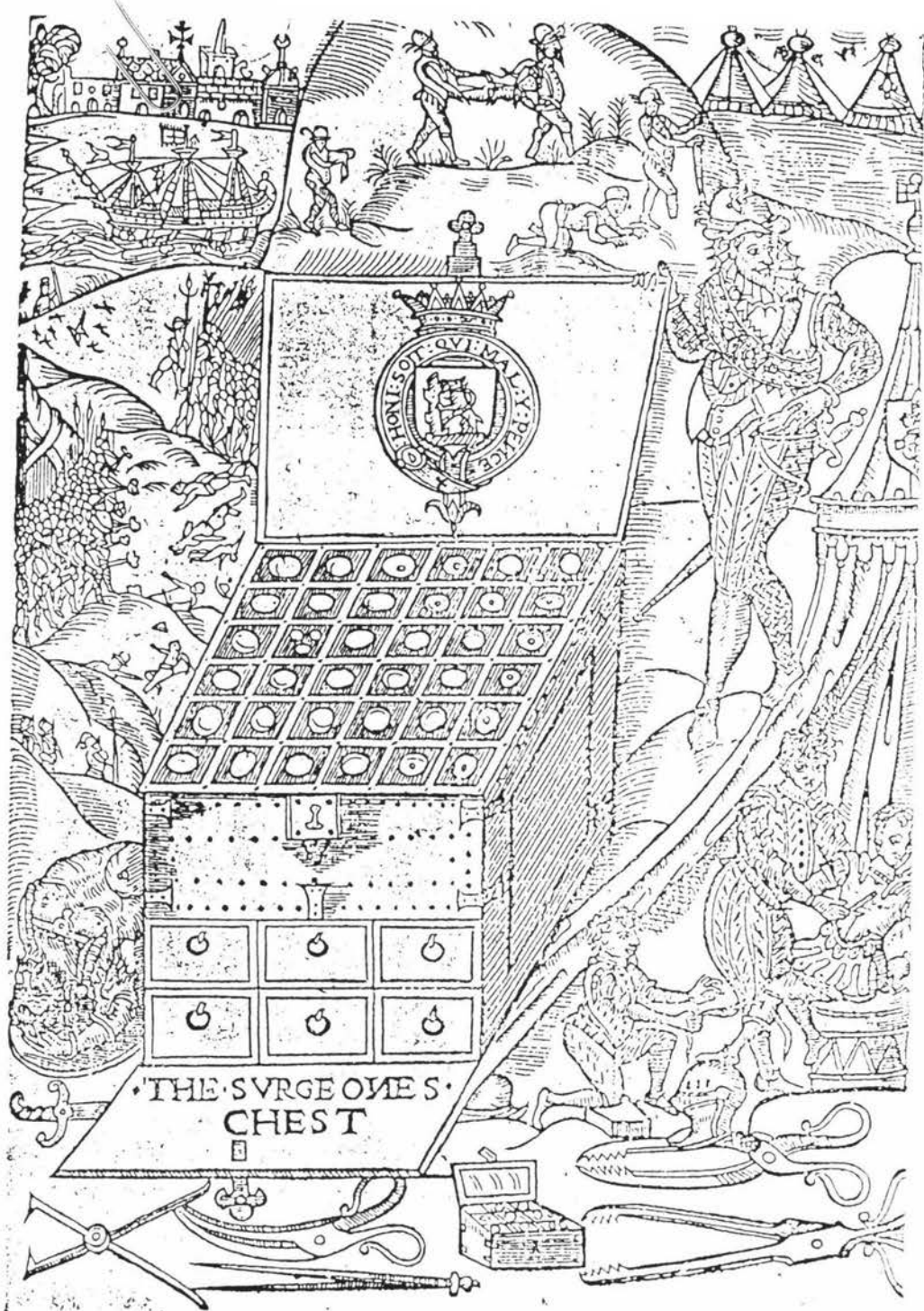
This mixture with the above ingredients was 'made ana mL', this term is not now in use but does not represent a litre as would be the case in a pharmaceutical prescription today as a litre as a liquid measurement was not introduced until 1793. Speculation suggests that it may be a symbol for a pint, a measure in use from 1483,^{7.16} or a gill (about a half-pint) which was also in use. The mixture would suit many purposes and would act as a 'cure all' although specifically advised by Clowes for gunpowder burns. Some of the ingredients may very well have given a type of skin over the burn. No doubt the ingredients could be varied, as there could be good use at one time for an astringent, or at other times for a material which may reduce haemorrhage and to cure ulcers.

Medical practitioners in the field would have had some experience of burns associated with the sieges of the time. Boiling oil poured from ramparts was a favourite method of deterring soldiers from climbing on scaling ladders. It is not clear if the most deadly form of incendiary device, Greek Fire, was employed in Continental sieges as it had been in Mediterranean wars and in particular at the siege of Malta. It certainly had been employed in the Turkish conquest of Bosnia at the battle of Siget in 1566 and is likely to have been used at the siege of Vienna by the Turks in 1529. The Landsknechts were active in the Austrian army and knowledge of it would soon have passed up to professional soldiers. This fearsome material was composed of 'secret' materials, but likely to have included naphtha, quicklime, sulphur and petroleum derivatives. Arrows were often tipped with burning cloth. The navy employed red-hot cannon balls needing a hazardous brazier to be available on the gundeck. Any source of fire is likely to lead to accidental burns to the handlers and prompt methods of treatment would need to be part of the general knowledge of the medical staff.

The text by William Clowes ranged much further than would be required as a guide to the young practitioner and his advice on wound treatment, which follows below, and indeed the whole text, may be regarded as a handbook of procedures.

Clowes makes many references to his clinical cases in which he claims to have cured the patient. In 1580, he cured William Mouch of a wound in the belly exceptional as abdominal wounds were regarded as universally mortal. There was also a case of a child aged ten, who he cured in 1586. He tells of taking out the shot from a pioneer (type of field engineer), wounded in the chin, neck and thigh. There are numerous reports of his successes. Clowes also recalls a soldier who he said pulled out an impaled sword from his own wound (probably from under the rib cartilage) that had penetrated to his back.

In the volume there is an illustration of a medicine chest (figure 12). On its inner lid is a Coat of Arms ringed with the words 'Honi:soit:qvi:mal:y:pence', the coronet is depicted with eight strawberries indicating the rank of Earl. The heraldic emblem shows a bear clawing an upright tree trunk. Elizabeth had appointed Clowes to her army in Flanders to attend Leicester and Clowes has embellished his chest with Leicester's arms as Clowes' heraldic emblem is known to contain three mullets in a chevron and three unicorn heads, this was not shown on the chest.^{7.17} The illustration shows in his chest what appear to be thirty-six spaces for carrying herbs. It has six large drawers, presumably for surgical instruments and a substantial lock, which when closed, a hinged flap could lock the whole chest. There are other depictions of interest. Clowes, or possibly Leicester, is shown with long legged hose and doublet, a ruffled collar, a hat and sword. Below, a surgeon and his assistant is depicted attending a wounded person who is seated on a stool or even a drum with his foot resting on a helmet. The whole scene is depicted to be in the doorway to a large bell shaped tent that shows a heraldic crest and a flag with a cross of St. George of England. A small casket of 'medicines' is shown nearby. To the left is shown a ship and below there is a military engagement; the force on the left is firing muskets, their opponents appear to have long lances and to be retreating leaving four dead. Above the main chest is what appears to be a casualty being transported on a stretcher and to his right are two soldiers with lower leg amputated at mid calf, one is crawling, the other is standing upright and may have a staff in his right hand. If a litter or stretcher being used to transport the wounded or dead person, it would suggest that there were persons in the army delegated specifically to this task.



NOTE THE REPRESENTATION OF
STRETCHER BEARERS AT THE TOP

Figure 12 ' The surgeon's chest' from Clowes' 'Prooved Practice'

Clowes was aware of the ground-breaking work of Ambroise Paré whom he calls a master on two specific occasions.^{7.18} Despite knowing of Paré's methods, he did not pass on this to his readers. He also acknowledges the excellence of the work of John Burvoice, a French surgeon, appointed to Lord Willoughby, who went to the Low Countries to 'curing of the hurt and incumbent soldiers'. Also in the service of Lord Willoughby's 1589 campaign to assist Henry the Fourth of France was John Woodall. His military service continued the Royal Navy later in his career, as did his official duties to the Company as a Warden and Master in 1633.

The text does not have any advice about suturing wounds. The fine fibers from the tendons of cows and horses and hair from horsetails were often used and were strong suture materials. The type of needles is not clear, were they bronze or bone? The Egyptians had also had a technique to dip a strip of linen into a gum and use the adhesive properties to pull wound edges together.^{7.19} Clowes does mention tapes, but just what use were they for? If the Barber-Surgeons knew that tapes could be used to pull the edges of gaping wounds together it would have been represent a major improvement in emergency wound practice. This technique was certainly known to Paré.

Among those who gave practical general advice to the practitioners was Philip Guybert who wrote 'The Charitable Physician with the Charitable Apothecary'. This was not published until 1639 but probably reflects some of the teaching during the previous forty years. He outlined the equipment and conduct of some methods of treatment.

Thomas Gale (1507-1587) a surgeon at one time in the army of Henry 8th, published in 1563 'Certain Works of Chirurgerie'. He had many words of advice to the young surgeon. He advocated that the surgeon should make use of healthful medicines to expel grievous infirmities and quoted the use of the 'innumerable trees, plants, fruits, herbs rotes, gummes, flowers mettals and carthics.'

Gale writes of curing wounds, fractures, lacerations, and a new way of stanching blood without cauterization of a powder. He criticized his 'brethren' writing,

They have no method, no exact maie or yet order in learning the principles of chirurgerie or also out of books, or from their masters or tutors. They are so confused in their studies and makes rather a rude chaos than a perfect art out of their chirurgerie.

Gale advocates that the surgeon should be 'gentle and courteous towards the sick patient.' In his third book ^{7.20} he gives a treatise on the 'gunshotte wounds' and burns due to 'gonnepouder'. He advocates treatment being the same as ordinary fire burns, and to apply:

Oil of bitter almonds ople of dliucs with falre

Or

A mixture of 2 parts of onion juice and 1 part of barnithe

If there was an ulcer present, treatment should have

Olei oliuarum

Secunde corticis

Sambuci.

These ingredients to be boiled, and strained and then have added,

Cerufse

Plumbi vsti

Lithargyri.

Make an ointment; do not open the bladders (blisters)

Within the Company of Barber-Surgeons, there were individuals of great distinction who had had actual battlefield experiences. Thus Clowes, Bannister, Gale and Woodall, it must be assumed, passed information of their experiences and their wisdom gained from the 'hands-on' situations of war.

It is of great interest that Gale also advocates not cauterizing wounds and using onion dressings; both being treatments advocated by Ambroise Paré.

Paré must be regarded as an outstanding clinical observer. It is likely that he did appreciate that burns healed more quickly with the onion paste than with other dressings. Gale may have found the use of onion from his own experience but is it not possible that a student of Paré passed this clinical finding to Gale? Paré appears to have been the most competent military surgeon of the 16th Century. Ambroise Paré (1510-91) was a 'self-taught Barber-Surgeon who wrote his 'Method of Treating Gunshot Wounds' in 1545 (not published in English until 1617) and served as an army surgeon all his life. His outstanding contributions included the development of better techniques of battlefield amputations. He used ligatures prior to below knee amputation, abolished cautery on his patient's wounds, utilized wound debridement (cleansing), and used adhesive bandages for closing wounds. He also attempted to design and utilize artificial limbs and eyes, and to implant artificial teeth. He condemned flies as carriers of 'contagion' ^{7.21}

There appears to have been some glimmerings of recognition that cleanliness was desirable when dealing the sick and wounded. The Frenchman Philbert Guybert had written 'The Charitable Physician with the Charitable Apothecary' in the late Tudor times but even though it was not printed in English until 1639, it is likely that his ideas were probably known in England during Elizabeth's time. He advocates among other therapeutic measures giving enemas of medicines. He says it is necessary for all sorts of people to keep with them a syringe or bladder and pipe and to make the clyster in the patient's house. He then goes on to say that should the patient have a 'pestiferous' disease, the pipe should be washed and cleansed, with the warning that if this is not done the disease can be on the patient and his family within an hour. He says to also warm the pipe and to not lend it to any other than 'to those that you know very well' ^{7.22} Within this advice there is the recognition that disease may be able to be transmitted by contaminated instruments.

In the field in Flanders it would be expected that the 'practitioners' be familiar with the usual sicknesses seen at any time in England. They would be able to deal adequately using the accepted standards with wounds caused by

cuts, stabs and trauma. Simple burns common to domestic hearths could be attended to the satisfaction of the troops. It is likely that they too were picking up the influences of the Continental approaches by mean 'word of mouth' and 'barrack gossip'. The outcome of the siege of Metz would have been a source of wonder to the fighting man, as too the results of the surgical genius of Ambroise Paré. It is interesting that skilled clinicians had recognized that the onion may have benefits in wound healing. Onions and garlic contain allicin, an amino acid derived from cysteine. Allicin has antibiotic properties about 1/50 power of penicillin against some common human bacteria including streptococci. With burns, the streptococcus haemolyticus is a common infection and resulting septicaemia is a major cause of death. Allicin, by mouth may have antithrombotic effects on platelets similar to aspirin. The activity is destroyed by distillation and any therapeutic benefit from onion oil prepared by this means as was common with the alchemists would have been lost.^{7.23}

REFERENCES

- ^{7.1} Gale, Thomas, 'Burns of gonnepowder' *Certain Works of Chirurgie*,(Amsterdam,1563). 22.3.19.
- ^{7.2} Cruickshank, C.G. *Elizabeth's Army*, Oxford University Press, London, 1946.p.122
- ^{7.3} Garrison, Fielding, H. *An Introduction to the History of Medicine*, (4th Edition, W.B.Saunders, Philadelphia, 1929), p.236.
- ^{7.4} Barthrop M. *The Armies of Britain*, (National Army Museum Press, London, 1980). p. 10
- ^{7.5} Schoen, Erhard. 'The Field Surgeon' *Hollstein's German Engravings, Etchings, and Woodcuts, 1400 – 1700*, (Sound and Vision Publications, Rotterdam, 2000), 42:212.
- ^{7.6} Similar instruments are seen in the texts by Clowes and Gale.
- ^{7.7} Gaimster, David. 'German Stoneware, 1200-1600', (British Museum Press, London), 1997
- ^{7.8} Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p. 121
- ^{7.9} Young, S. *Annals of the Barber-Surgeons*, (Blades, East & Blades, London, 1890), p.536
- ^{7.10} *Ibid.* p.447
- ^{7.11} Clowes, W. *Prooved Practice for All Young Chirugians, Concerning Burnings With Gunpowder* London, 1596.
- ^{7.12} Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946), p.121
- ^{7.13} Clowes, W. *Prooved Practice for All Young Chirugians, Concerning Burnings With Gunpowder* London, 1596. p.77 also p.118
- ^{7.14} *Ibid.* p. 3
- ^{7.15} *Ibid.* p. 77
- ^{7.16} Pint. A liquid measure first used in 1483, Source Oxford English Dictionary, 2nd. Edition Ed. Simpson J.A.& Weiner, E.S. Clarendon Press, 1959.
- ^{7.17} Young, S. *Annals of the Barber-Surgeons*, (Blades, East & Blades, London, 1890), p.535
- ^{7.18} *Ibid.* pps.110-111.
- ^{7.19} Lyons, A.S. and Petrucelli, R. *J. Medicine- an Illustrated History*. (Macmillan, Aust.1979).

- ^{7.20} Gale, Thomas. Burns of gonnepowder. *Certain Works of Chirurgerie*. (Amsterdam, 1563), 3:22:19.
- ^{7.21} Gabriel, R.A. and Metz, K.S. *A History of Military Medicine*, (Greenwood Press, New York, 1992), p.70. Also Wangenstein, *Bulletin of the History of Medicine*, 46:3:207-234, 1973.
- ^{7.22} Singer, Charles, 'Medicine in the Reign of Elizabeth 1st', *The Medical Annual*, (John Wright, London, 1953), p.17
- ^{7.23} Ref. www.chm.bris.ac.uk. University of Bristol, School of Chemistry.

CHAPTER 8

GUNPOWDER AND FIREARMS.

In mid fifteenth century the art of war underwent a revolution as the infantry became the chief arm of the military and the heavily armed horsemen of the Middle Ages virtually disappeared.^{8.1} The traditional longbow of England, eighteen foot pikes in dense squares as used effectively by the Swiss and French, and finally the cannon and the handgun all undermined the effectiveness of the medieval cavalry.^{8.2} Light cavalry were often armed with pistols or calivers and remained useful for scouting. Gunpowder allowed the development of grenades, bombs and petards in the military. However despite the changes to the use of gunpowder fired weapons, Leicester took to the Netherlands a company of bowmen^{8.3} and the bow skills were still part of the training of the militia, but those with this skill were now classified among the 'untrained' men.

Henry the Eighth was greatly interested in artillery but mainly for defence. Cannons were at first imported to England from the Continent until 1535 when John Owen was casting them for the navy and for Henry's shore defences. Henry the Eighth is said to have had little interest in handguns.^{8.4}

A survey of the guns in use at Portsmouth by Sir Henry Lee, the then Master of the Armoury, found that many weapons were in urgent need of repair. He also found a great lack of gunpowder, the calivers were decayed, and 'the flashes and touchboxes were broken and worn.' The touchboxes contained a finer grade of gunpowder for priming use. He had reported to the Privy Council on 26 September 1586 and thus prior to the Armada.^{8.5} The Sussex ironworkers were instructed by the Privy Council to turn their attention to the manufacture of guns for the service of the Crown, and each gun marked with the Queen's arms.

The English Barber-Surgeons and other practitioners of the sixteenth century should have been fully aware of the medical complications rising from

unwanted accidents from poor handling of gunpowder as it had been used for over a century. Gunpowder had been used by the infantry in Europe at least from the battle of Cerignola in 1503.^{8.6} It was used in siege guns and for undermining fortifications usually by the pioneers. The treatment of the likely wounds from the use of artillery, by direct injury and indirectly by shrapnel was a necessary part of every military practitioner's skills. They were required to be able to cope with burns, which resulted from premature ignition in the pans of handguns and from the accidental ignition of powder while in transit from the store to the weapons. Initially artillery was novelty used by the wealthy princes in Italian wars; the cannons were made of bronze, either huge in size and weight or very small. They fired balls of stone. The value of a cannon in battle then was more psychological than practical. They emitted vast amounts of smoke and noise, misleading and confusing the enemy.

Portable firearms prior to the battle of La Bicoque in 1522 were basically miniature cannons. They were also very heavy.^{8.7} It is believed that a Swiss developed the idea of resting the weapon on a stick, leading to the 'forked arquebus'. The arquebus was also known as a harquebus and the term is derived from the German literally meaning a 'hook gun' ^{8.8}

In England, the Privy Council appears slow to recognize that warfare was changing. In 1537, the Guild of St. George in the City of London was formed, 'to be overseers of the science of artillerie, that is to witt, long bowes and hand gones'. Subsequently this livery company became the Honourable Artillery Company, and a reserve force of the Crown. Part of their remit was to train the officers of the 'trained bands' in the use of handguns. These moves were made independently of the Crown. In 1539, Henry had a reviewed 15,000 London militiamen or trained bands, as they became known. It has to be questioned how many of these were familiar with the techniques of using gunpowder safely and efficiently. Henry placed great emphasis upon artillery with which to arm his navy and the forts of southern England. ^{8.9}

The English Normandy force in 1589 had companies of one hundred men, of these sixty were pikemen, the remaining forty had heavy muskets, which

needed an extension of a rest. Some had a caliver was lighter and able to be fired from the shoulder or a 'barstard' which was a weapon between a musket and the caliver.^{8.10} By 1591, in Essex's expedition to France, the ratios had changed to forty pikemen, twenty musket men and thirty calivermen. By the end of Elizabeth's reign the cost of a caliver was twelve to thirty shillings and the musket eighteen shillings to two pounds. Improved technology was increasing costs.

However even as late as 1593, not all Englishmen were convinced that the new weapons were superior to the traditional longbow. Matthew Sutcliffe wrote spirited defence of the older weapons in his book published in 1593;

The Practice, Proceedings, and Lawes of Arms, described out of the doings of most valiant Captains and confirmed both by ancient and modern examples and precedents.

The English longbow was a formidable weapon. It was made from yew wood, and six feet and four inches long. The archers shot cloth-yard shafts fitted with a barb of iron and fledged with goose or peacock feathers. They were able to penetrate oak to a depth of two or more inches. The arrow had been known to pass through a victim and inflict a wound on others beyond the first person or animal.^{8.11}

Sir John Smythe in a written work defended the previous weapons and showed that there was general knowledge of the poor state of the Leiceister's campaign among the nobles and gentlemen. He wrote 'Proeme Dedicatorie, to the Nobilitie of the Realme of England', (figure 13). Sir John Smythe was the son of a sister of Jane Seymour and first cousin to Edward the Sixth. He had studied under Maximilian the Second. In 1576 he was sent as an envoy to Philip the Second to intercede on behalf of the Netherlands; this was his last appointment. This book was suppressed by warrant on 14 May 1590 within a fortnight of its publication. Subsequently for another speech he was committed to the tower in 1596. With such a political background and royal

Discourses, writte

by Sir John Smythe, Knight:

Concerning the formes and effects of
diuers sorts of weapons, and other verie

important matters Militarie, greatlie mistaken by
diuers of our men of warre in these daies; and
chiefly, of the *Mosquet*, the *Caliuer* and the *Long-bow*;
As also, of the great sufficiencie, excellencie, and
wonderful effects of *Archers*: With many notable
examples and other particularities, by him present-
ed to the Nobilitie of this Realme, & published for
the benefite of this his natie Countrie of *England*.

W. Herbert
1772



AT LONDON,

Printed by *Richard Iohnes*, at the signe of
the *Rose and Crowne* neere *Holburne*
Bridge. 1. *May*. 1590.

SIR IOHN SMYTHE
his Proëme Dedicatorie, to the
Nobilitie of the Realme
of England.

Right Honorable and
most noble Lordes:

Euen as the Wisedome and humi-
litie of the notable men of later ages,
haue giuen greater honor to the ex-
cellencie of men in all Artes and
Sciences of former ages and greater
antiquitie, than to themselves; not onlie acknowledging them-
selves to be inferiours vnto them, but also, that the greatest skil
and knowledge which they haue attained vnto, hath (in the
greatest part) proceeded from such notable men, either by hea-
ring and obseruing their opinions, or by reading of their works,
or els by reading of others that haue written of the iudgements
and actions of such excellent men: Euen so, the vanitie and
overweening of yong men, and chieflie of our Nation in this
our time (I meane within these twentie yeares) haue so exce-
ded and superabounded, that they haue not been ashamed, nor
onlie to attribute vnto themselves greater Wisedome and suffi-
ciencie in all Arts and Sciences, and speciallie in the Arte
Militarie, than to the notable men and great Captaines of for-
mer ages and greater antiquitie, but also to dishable them in
respect of themselves and their sufficiencie, and all others also
yet liuing, that are men of greater yeares and antiquitie, than
they are, both of our owne Nation, as of other Nations.

contacts, his opinion may have been widely discussed by his peer group possibly influencing military policies.

This publication was seen as protest against the followers of Leicester in particular about the dishonesty and greed that appeared to have motivated them to join him. The advice they gave him during the time of his command in the Low Countries 1585-6 was of concern as it would benefit the Captains but not the troops. The reports of Thomas Digges, the muster-master, certainly confirmed this. The whole treatise is a protest against the changes in military art, which had slowly been gaining ground. In particular he believed that firearms were inferior to the longbow. Smythe considered that:

Harquebusses, by many miscalled calivers, though as good as fifty years ago as at the time of writing were better than muskets; which being of greater length and height of the bullet, and more ramforced, were heavier, and, moreover, required to be fired from rests; a necessity which precluded their use in skirmishes

He claimed that:

A great many skirmishes that have been very hot, and continued for many hours, with new supplies on every side, it hath often happened, that in discharging on both sides many thousands of bullets within three, four or five scores and nearer, there hath not been on both sides slain and hurt with bullets, thirty men.

Smythe claimed that the effective range of the longbow was eight to ten score (yards). It is easy to see that old soldiers like Sir John who had been raised on the effectiveness of the longbow were still of the same view and that his arguments were quite sound in defending the role of the weapon.

The iron cannons were replaced by the use of brass and copper as the knowledge of the casting techniques improved. These and later cannons were liable to explode with terrible burns and injuries. Paré described the newer

weapons as 'horrible monsters' and listed the many variations of firearms as cannons, double cannons, bastards, musquits, field pieces, culverines, serpentines, basilisques, sackers, falcons, falconets, 'names not only drawn from their figure and making, but also from the effects of their cruelty'.^{8.12} He wrote also of fowling pieces, pistols and small handguns. The calevers and muskets require a rest and thus may be called breast guns, as they cannot be laid against the cheek and led to the invention of harquebuses, which became the weapons of footmen and light horsemen.

Paré lists other types of 'cruel' weapons. 'Mines, countermines, pots of fire, traines, fiery arrows, lances, crossbows, barrels, balls of fire, burning faggots, granats (grenade) and other fiery engines.'^{8.13} All of these agents of the new wars presented the same challenges to the military medical practitioner, namely burns and extraordinary wounds to the body cavities, limbs, head and brain.

The chance of being wounded must have been even more terrifying for the infantry with the development of canisters and grapeshot of more effective killing power as the missiles covered a wider spread if the infantry were clustered, as had been the case with lances in squares. The soft metal containers were filled with anything at hand, metal balls, rocks, shards of glass and nails.

By 1570, the Privy Council recognized that more troops needed training in the use of the arquebus and the caliver, as well as the cheaper muskets. The Council required the muster-masters of the companies to attend to carry out the training drills, (figure 14). The traditional longbow lost its popularity as the gunpowder weapon training progressed. The Privy Council endeavored to persuade counties to prohibit popular games, such as bowl and dice, at village fairs and to enforce archery games on public holidays. Men who had received training by 1573 were obviously more sought after and were entitled to be in 'trained bands' and they eventually were the groups most often mustered. Pay on a limited scale was given in some counties to attend the musters and by this means it is shown that the Privy Council had moved a



Figure 14 Early musket with support

long way towards recognizing the need for central government input into modernizing the English armed forces,^{8.14} (figure 15).

There were three new problems for the military surgeon in the field of battle.^{8.15} These were the burns from gunpowder, the gunshot wounds and the compound fractures resulting from the missiles.

The gunpowder burns and wounds from metal fragments often were the result of the poor quality of casting of the cannons resulting in their explosion when fired. In the Spanish Armada many of the Spanish cannons exploded, suggesting that they had not been tested by test fired at the foundries at Lisbon and Malaga.^{8.16} English cannon were also known to have exploded in the Netherlands^{8.17} Poor technique in the drill of cannon loading possibly may have contributed along with poor barrel swabbing and loading of inexact measures of powder. Powder in quantity was transported in barrels by ship and by animals, and was potentially dangerous if handled carelessly. The navy also employed fire ships, needing men of great courage to prime them in view of the risk involved. How were the stores of ball and powder supplied? Musketeers needed lead, bullet molds and thousands of feet of match.^{8.18}

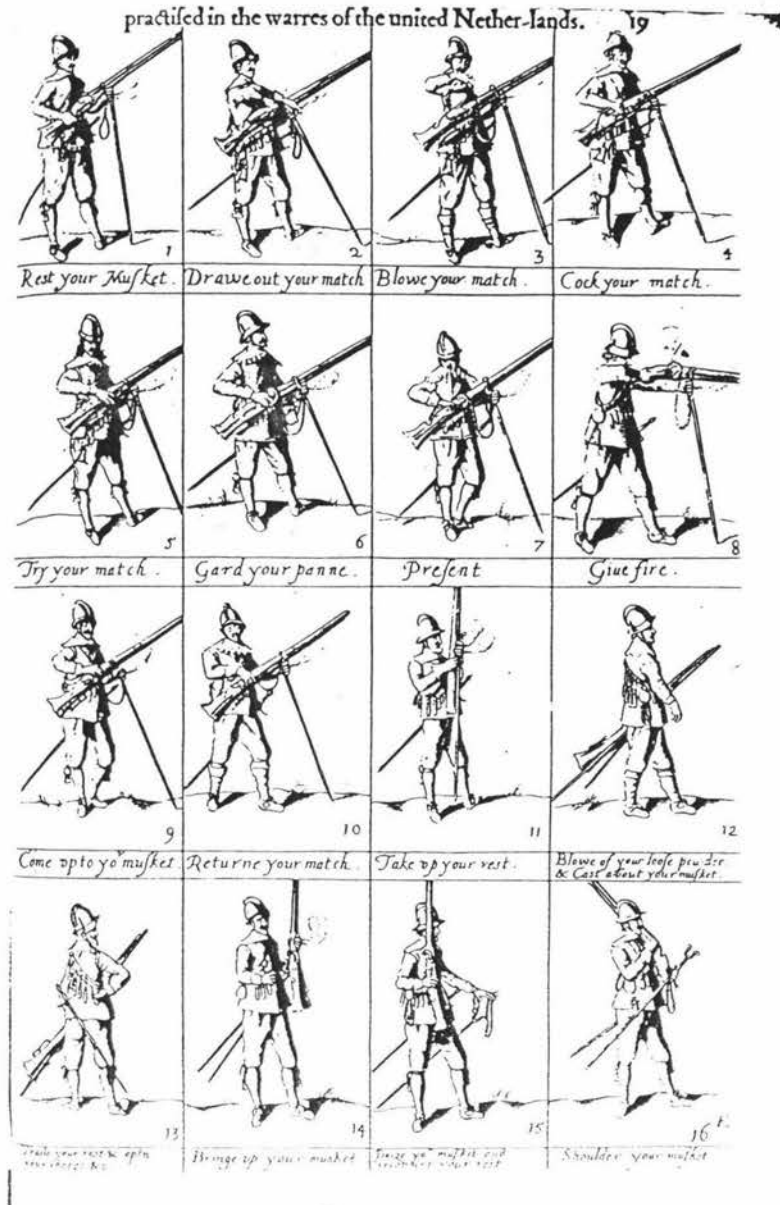
The very nature of the early unsatisfactory design of the breast guns and the arquebusses also may have led to explosions and burns; also technically the unstable nature and often-defective manufacture of the gunpowder may have been contributing backfires and flashes. The powder production could vary in quality. One of the biggest fraud scandals of Elizabethan times was the discovery that much of the gunpowder was substandard. In 1584, the production was in the hands of the Earl of Warwick who was Master of Ordnance.^{8.19} After his death, it was found that he had misappropriated funds. George Evelyn the grandfather of the celebrated John Evelyn the diarist exposed this fraud.

The Privy Council in mid 1588 awarded George Evelyn together with an ordinance officer a contract to manufacture of gunpowder. They were allowed to purchase a supply of saltpetre, which had been stored in the Tower of

Figure 15 Musket drills from Hexham, p.20

Henry Hexham, *The Principles of the Art Military Practiced in the Wars of the United Netherlands*, 1637

By the end of the sixteenth century the musket and its lighter variant, the caliver, were the standard missile weapons for infantry both in England and on the Continent. The musket was hard-hitting and if primed and loaded with care was capable of reasonable accuracy. It was a matchlock—that is, it was fired by pulling a trigger which lowered a smoldering match into a pan containing priming powder—and was mechanically very simple and cheap to make. As against this, it was complicated to fire. The scenes here show just one half of the full range of operations involved in firing and reloading. The weapon was virtually useless, indeed positively dangerous, in the hands of untrained men, and the need for regular drill and practice was one of the arguments that led to the formation of a standing army. Instruction sheets like this were printed in various forms to aid the volunteer captains who drilled the trained bands of the militia, and the movements and words of command had become reasonably standardized by the time Hexham's book appeared. Nos. 4 and 5 refer to the operations of fixing the match to the cock and testing its length to make sure that it would come in contact with the priming powder when the trigger was pulled.



London. It was considered that Evelyn would be able to supply the necessary charcoal from his woods ^{8.20} In addition two ordnance officers were to test the gunpowder and saltpetre. There was a Royal armory at Woolwich, Rochester and at Chatham and also small county stores for training of militia. These stores were vulnerable to fire and explosion as it would appear that many were frequented by vagrants who were known to light straw fires nearby.^{8.21} The county stores and their security were under the jurisdiction of the Lords Lieutenants.

Prior to 1561, England was dependent upon imported gunpowder. The government then purchased a method to produce saltpetre (potassium nitrate) by harvesting animal droppings. Saltpeter could to be made by mixing lime, ashes, and earth treated with animal excreta. The gunpowder manufacturers were allowed to dig into dovecotes, barns, stables, stalls and outhouses. However sulphur for the gunpowder mixture was still imported, as English chemistry was not sufficiently advanced to extract it. The other ingredient was charcoal, which was plentiful. The efficiency of production was such that by 1601, England was exporting gunpowder to the Netherlands.^{8.22} The gunpowder was transported to the Netherlands in barrels. One of the gunpowder factories was set up in Fleet St. and blew up in a fire on 30 June 1588, a warning to all soldiers about the hazards of gunpowder. The loss of supply may have led to shortages in powder for the Flander's army as well as to the navy.^{8.23}

The original formula for gunpowder used by Roger Bacon (1214-1292) was saltpetre 41.2%, charcoal 29.4% and sulphur 29.4%. Over time the amount of saltpetre was increased. (In 1882, German gunpowder had 78% saltpetre). It can be imagined that the experiment to design the correct proportions would lead to substandard powder.^{8.24}

A curious feature of the use of firearms by levied soldiers was that their pay was supposed to cover costs for fuel, light and laundry. There was also a levy for the medical practitioner, the company clerk, the muster master, priest, and for the cost of gunpowder used by the soldier. The soldier could be seen

to be left with practically no money if all these requirements were followed, and thus soldiers had a reluctance to train, become familiar with their weapons and practice. Insufficient practice would also lead to a slow rate of fire.^{8.25} The restriction by cost was discussed by the Privy Council in June 1588 and orders regarding its careless use were sent to the training officers. This awareness of scarcity of gunpowder remained until 1599-1600 when it was agreed that more gunpowder would be made available for training and in battle.

The arquebuses and muskets improved in design with time. Basically a fire lighting mechanism was needed involving a piece of punk which was lit by a 'match', the burning punk then contacted the gunpowder that was held in an open pan, the resulting explosion forcing the projectile from the barrel of the gun. With haste to reload in the heat of battle it would be easy for the soldier to pour too much powder into the pan with a resulting explosion. When taking aim with some of the firearms, the soldier may have placed the firearm against his collarbone to sight along the barrel. A flash back (a flash in the pan) then would cause fearful burns to the side of the face and possible eyelid and eye burns often with resulting blindness. The wheel-lock firearms were long barreled and introduced in about 1565 as German-made weapons for the Janissaries of Suleiman the Great and used in the Siege of Malta against the Knights Hospitallers. They were said to be much more accurate but the loading time was much longer than the arquebuses,^{8.26} The slow firing rate was a problem with the arquebuses even if the men were well trained.

One of William Clowes' texts was 'Prooved Practice for all young Chirurgicalians, concerning Burnings with Gunpowder'^{8.27} The mixture for burn therapy which he suggested would suit many purposes and would act as a 'cure all' although specifically advised by Clowes for gunpowder burns. Some of the ingredients may very well have given a type of 'skin' over the burn. The most popular dressings for burns were ointments from vegetable and animal components; ointments would be likely to produce blistering with subsequent scar tissue. Some treatments used various inks, some of which may have contained tannic acid, which would help in forming a 'skin'^{8.28}. Paré used a

paste of crushed onions and salt that was less liable to produce blisters. He apparently discovered this treatment from an old country woman, showing that he may have been influenced by the accepted concepts of village medicine in this area. Certainly burns in villages would have been not uncommon.

Gunshot wounds would have posed an entirely new set of problems for the military medical practitioner. The attending medical practitioner may not have previously seen such hideous wounds; the bullets were capable of causing gaping wounds of the cavities. Head wounds opening the brain would be common and also grotesque face, mouth and throat wounds. The soft tissues would be torn about and fragmented and therefore often impossible to suture with tread or pull together with bandages. These wounds are usually associated with severe haemorrhage and shock. All practitioners understood that an abdominal wound was deadly, simple bandaging even with shattered ribs may in simple cases have helped chest wounds.

The early firearms shot a lead bullet weighing about half an ounce (fifteen milligrams). The muzzle velocity of the projectile was relatively slow and the bullet very unstable in flight, the lead shot often became deformed and flattened possibly as it left the barrel or in flight, and when striking the victim, the lead may have been quite flattened. The flat bullet may have fragmented further in the body and would tear tissues apart violently. The force generated could cause bones to shatter and lead to compound fractures with an entry wound to be attended to as well as attempting to bind or splint the bone.

The irregular point of entry through the material of the uniform or leather chaps and boots, passing at low speed would tend to carry part of the material into the wound. It is a normal part of the body defences that foreign material is enveloped with a mixture of serum, white cells and repair cells that to the untrained observer may have been regarded as infected pus. The teaching of Hippocrates and Galen was that this mixture was 'laudable' pus and suppuration was necessary. It seems likely that the later surgeons and who tended to look up pus as undesirable may have misunderstood this teaching

that the pus was a good thing to happen. The foreign material such as cloth or leather as well as the bullet in the wounds was regarded as being undesirable for healing and the shot itself was poisonous and should be removed usually by probing with the fingers. Some surgeons did have probes in their kits to locate the bullet.

Medical practitioners particularly on the Continent soon recognized the high rate of infection and death from gunshot wounds. This high death rate caused the Alsatian military surgeon Hieronymus Brunschwig in 1497 to suggest that poison in the wound was the cause of the high death rate.^{8.29} This theory was given great credence by Giovanni da Vigo (1460-1520) who published this theory in 1514 in a medical treatise.^{8.30} He was the personal physician of Pope Julius the Second and very influential. It was the practice to counter the poison by treatment by cautery and by the instillation of boiling oil, usually elder oil mixed with 'treacle'. Heat of this intensity certainly would have a haemostatic effect but at the cost of extreme surgical shock and death. Both Paré and Paracelsus believed that there was nothing poisonous in gunshot wounds and they should be left and treated as any other wound. Paré based his belief on his experimental evidence. William Clowes, although regarding Paré very highly, seems not to have passed on this piece of wisdom to his young colleagues unless it was passed on by word of mouth or in the classroom. Gale however recommended not using cautery and using onions as advocated by Paré.

The medical problems of Elizabeth's army were not solely in Elizabeth's army. In 1575, Luis de Requesens, Spanish governor-general in the Netherlands wrote to Philip that 'most of the wounds come from pikes or blows, and they will soon heal, although there are also many with gunshot wounds, and they will die.'^{8.31}

Totally new to the army surgeon was how best to treat compound fractures. The seriousness and likely fatal outcome was recognized even from the time of Hippocrates and had caused him to advocate amputation in this context. The earliest portrayal of a surgical amputation is by Hans von

Gersdorf in 1517.^{8.32} The surgeon is using a cross-saw for a below knee amputation, (figure 16). There is a tie below the knee (not above if it was intended to act as a ligature) called a 'esmarche'. One of his assistants holds a bladder from a bull, ox or hog as a pad to be applied quickly to the stump to staunch blood flow which may have been dipped in an antihemorrhage agent or styptic composed of lime, vitriol, alum, aloes and nutgall. The other assistant has a clenched left hand and is possibly also wounded and seeking assistance. The patient is shown as amazingly unrestrained and placid. Is he drunk? Knocked unconscious? Or as suggested in the text under the influence of the juice of a narcotic plant which would require it to be volatile. If so what was it? It appears that some attempt was made at anaesthesia by allowing the patient to breathe from a sponge or clothe soaked in a mixture of opium, (from the opium poppy, *papaver somniferum*), hyoscyamus (from the seeds of *hyoscyamus niger*), and belladonna. (derived from deadly nightshade)^{8.33} The suggestion that this mixture was inhaled does appear feasible, as although these substances are non-volatile in their native form with heat the vapour could carry active ingredients. The text suggests that Gersdorf may have introduced the practice of painting the wound with a coagulating liquid prior to applying the animal bladder.^{8.34}

Throughout the text by William Clowes, there is no mention of any pain killing items. The major effective materials are the opiates derived from the opium poppy. The opium poppy was not mentioned, either as *Papaver somniferum* its generic name, the more widely used derivative laudanum of later years nor any recognizable other tinctures of opium. As pointed out previously, if Avicenna had known about opium in detail, he surely would have passed on that knowledge. Even though Paracelsus had developed laudanum (tincture of opium) there is doubt that he knew about its properties for pain relief. Is it possible that this tincture was just one of the many chemical items which he produced? The sixteenth century military surgeons would have It is said that a mixture of opium with mandragon^{8.35} (mandrake)^D

^D Hyoscyamus or scopolamine was the active substance from mandora and derived from the mandrake plant. It was possibly used by the Egyptians as a 'twilight sleep'. Probably known to Paracelsus.



From a printed Western medical book by Renaissance military surgeon Hans von Gersdorf, *Feldbuch der Wundartznei* (Strasbourg, 1517).

Figure 16 First portrayal of an amputation, 1517
From Gabriel and Metz, p.55

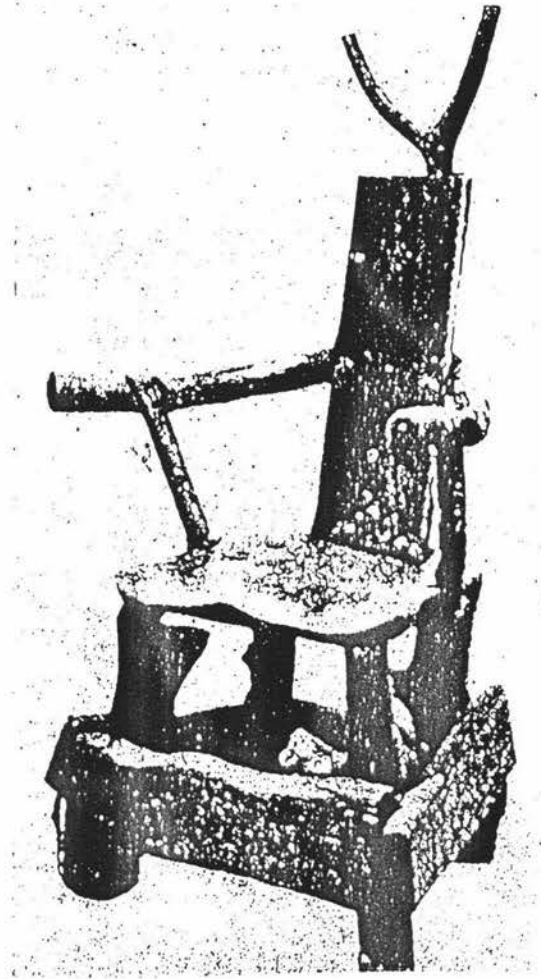


Figure 17 Dentist's chair, period of Henry VIII from Ring p.129

Ambroise Paré had an extensive dental practice^{8.39} and used practical and rational methods in treatment. Jaw fractures were stabilized by gold wire; he attempted to replace avulsed teeth by wiring them to adjacent sound teeth and also devised artificial teeth using a gold base and artificial teeth carved from ivory.

For teeth removed by trauma he advocated that the gum be first allowed to heal before undertaking implantation or use of artificial teeth. Paré did attempt to deal with deformities of the mouth and palate when a hole (fistula) had been formed between the nasal cavity and the mouth by wounds or by syphilitic disease, a not uncommon finding in this disease. He used a 'plug' that could be inserted by the victim into the hole and removed by him from time to time.

The changed pattern of sieges and armed warfare from the cutting wounds of arrows, lances and swords that came about by the introduction of gunpowder related weapons were treated by the 'practitioners' with the best skill they could muster. However head, thorax and abdominal wounds by bullets or shrapnel would continue to be poisonous and probably terminal. In the field, it is likely that a form of triage existed and those with this type of wound were put to one side as lost cases. It maybe that some recognized the need for better pain relief than using alcohol but there is no evidence for this within the writings of Clowes.

REFERENCES

- ^{8.1} Hale, John, *The Art of War and Renaissance England*, (Folger Shakespeare Library, U.S.A, 1961). p. 1-2
- ^{8.2} Barthrop, M. *The Armies of Britain*, (National Army Museum Press, 1980). p. 10
- ^{8.3} Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p. 60
- ^{8.4} Barthrop, M. *The Armies of Britain*, (National Army Museum Press, London, 1980). p. 13
- ^{8.5} *Acts of The Privy Council, New Series*, (H.M.Stationary Office, London, 1897), 14:233,1588
- ^{8.6} Cavendish,R. 'The Treaty of Lyons', *History Today*, Vol.54, Issue 1, January, 2004.p.55
- ^{8.7} Barthrop, M. *The Armies of Britain*, (National Army Museum Press, London, 1980). p. 13
- ^{8.8} Oxford English Dictionary, (Clarendon Press, 2nd Edition), 1959
- ^{8.9} Barthrop, M. *The Armies of Britain*, (National Army Museum Press, London, 1980). p. 13
- ^{8.10} Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p. 61
- ^{8.11} Gabriel,R.A.and Metz,K.S. *A History of Military Medicine*, (Greenwood Press, NewYork.1992) 1:20

- 8.12 Ibid.p.131
- 8.13 A granate is a type of grenade, Oxford English Dictionary, (Clarendon Press, 2nd Edition), 1959
- 8.14 Guy J. *Tudor England*, (Oxford University Press, Oxford, 1988). p. 340
- 8.15 Gabriel,R.A.and Metz,K.S. *A History of Military Medicine*, (Greenwood Press, NewYork.1992) 1: 53
- 8.16 Guy, John. *Tudor England*, (Oxford University Press, Oxford, 1988), p.343
- 8.17 Motley, J. L. *The United Netherlands*, (John Murray, London, 1869), p. 392
- 8.18 Hale, John. *The Art of War and Renaissance England*, (Folger Shakespeare Library, U.S.A, 1961). p. 121.
- 8.19 Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p. 63
- 8.20 *Acts of The Privy Council*, New Series,.(H.M.Stationary Office, London 1897), 16:11. 1588
- 8.21 Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p. 69
- 8.22 Ibid.p.68
- 8.23 Forbes, Thomas. 'The Changing Face of Death in London.' *Health, Medicine and Mortality in the Sixteenth Century*, (Cambridge University Press, Cambridge, 1979). p. 135
- 8.24 Longman's. *Illustrated Encyclopaedia of World History*, Peerage Books, Avon, England. 1985
- 8.25 Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p. 69
- 8.26 Seward, Desmond. *The Monks of War*, (Penguin Books, England). p. 278
- 8.27 Clowes, W. *Prooved Practice for All Young Chirugians, Concerning Burnings With Gunpowder* London,, 1596.
- 8.28 Segerist, Henry, E. 'Ambroise Paré's Onion Treatment of Burns', *Bulletin of the History of Medicine*, 15:2:144, 1944
- 8.29 Garrison, Fielding, H. *An Introduction to the History of Medicine*, (W.B.Saunders, Philadelphia, 1929. 4th Edition), p.202.quoting *The Art of Healing Wounds' or Feldtbuch der Wundartzney, Strassburg, 1517*
- 8.30 Gabriel, R. A. and Metz, K. S. *A History of Military Medicine*, (Greenwood Press, NewYork.1992). 1: 56.
- 8.31 Hale, John. *The Art of War and Renaissance England*, (Folger Shakespeare Library, U.S.A, 1961). p. 121.
- 8.32 Garrison, Fielding, H. *An Introduction to the History of Medicine*, (W.B.Saunders, Philadelphia, 1929. 4th Edition), p.202, quoting *The Art of Healing Wounds' or Feldtbuch der Wundartzney, Strassburg, 1517*
- 8.33 Garrison, Fielding, H. *An Introduction to the History of Medicine*, (W.B.Saunders, Philadelphia, 1929. 4th Edition), p. 202
- 8.34 Gabriel, R. A. and Metz, K. S. *A History of Military Medicine*, (Greenwood Press, NewYork.1992). 1: 72
- 8.35 Hyoscyamus or scopolamine from mandora derived from the mandrake plant was possibly used for 'twilight sleep' by the Egyptians.
- 8.36 Lyons, A.S. and Petrucelli, R. J. *Medicine- An Illustrated History*, (Macmillam, Aust.) 1979.
- 8.37 Copeman, W.S.C. *Doctors and Disease in Tudor Times*, (Dawsons of Pall Mall, London, 1960), p.152
- 8.38 Brunshwig, Hieronymus. *The Book of Chirurgia*, Milan, (R.Lier, 1923. Strassburg) 1497
- 8.39 Ring, M.E *Dentistry, An Illustrated History*, (Abrams Publishers, St.Louis.1985). p.129

CHAPTER 9

ARMY ILLNESSES, PHYSICAL AND MENTAL

The loss of men in an Elizabethan army by disease and death can be judged by the mortality rates reflecting the effects of illness and climatic conditions. Some idea of the magnitude of the losses may be judged from figures derived from the campaigns in France between 1589 to 1591. In the three years, 11,000 English died but of these only 1,100 fell in battle. The survivors were said to have made 'most slanderous speeches of those her Highness's service and entertainment.'^{9.1} The causes of death would be multifactorial but in particular plague, unsanitary conditions, and shortages of supply and transport of food would be major factors.

Of all of the factors undermining the health of the Elizabethan forces, starvation and malnutrition must take first place. Throughout the accounts of the military leaders on land and at sea, the problem of feeding her forces is addressed at the same time as lack of money. Many of her leaders did take some steps to ensure that their men were effective fighters by employing last ditch measures. Leicester paid men upon his arrival in Flushing; some of the money out of his own pocket but paid very little subsequently. Wilkes also paid for food for men himself, as did Lord Howard on the demobilizing of the navy after the Armada. Howard refused to discharge his seamen unfed and starving. He sequestered money from a captured treasure ship to pay them and as much again from his own pocket. He petitioned the Queen for recompense without success it is believed. These men had 'saved' England and provided Elizabeth with a triumph but she appears to have been callously indifferent to their needs.^{9.2}

Sir John Hawkins when reconstructing the navy tried to prevent sickness and the resulting death rate in the navy. He recognized that there was little hope of Elizabeth making more money available to feed his sailors. In 1585, he changed the scale of pay so that he could man his ships with many less hands, better paid and more fit. At the same time the victuals cost was

reduced. All these steps he assumed would be approved by Elizabeth. He stated that the men 'were clean without vermin and noisomeness, which breedeth sickness and mortality, all of which could be avoided.' He claimed that there was no experienced captain 'but would rather have 250 good men than 300 of tag and rag'.^{9.3} William Borough, the vice-admiral on the Drake expedition to Cadiz in 1587 and member of the navy board had been placed under arrest on the 'Golden Lion' because the crew had mutinied for lack of food while under his command. He was cleared of the charges and returned to the Board but certainly he could not claim to be ignorant of the poor state of the men because of lack of pay. Nothing improved.^{9.4}

So serious was the state of health of the navy personnel, that the Commander in Chief, Lord Howard wrote on 22 August 1588 to the Queen specifically about the sickness that was present in the navy,

With great grief I must write unto you in what state I find your fleet here. The infection is grown very great and in many ships, and now very dangerous; and those that come in fresh are soonest infected; they sicken the one day and die the next. It is a thing that ever followeth such great services, and I doubt not but with good care and God's goodness, which doth always bless your Majesty and yours, it will quench again'.^{9.5}

This report was written after the dispersal of the Armada in 1588 and as the rate of death was unusual, it suggest that even if the state of health of the recruits was poor to commence something extraordinary was also being experienced.

Sickness in ships was the rule even when they had been at sea for only a short time; scurvy takes some many weeks at sea to be manifest and was often associated with longer voyages than merely plying up and down the coastal ports and the Channel. The illnesses otherwise expected would be those common in the crowded conditions where bathing facilities did not exist and close human contact was obligatory. The most virulent disease under these conditions was ' gaol fever' or typhus. Medina Sidonia, the Spanish

commander in August 1588 reported 3,000 cases of sickness in the Spanish fleet, mainly from typhus.^{9.6} The English practitioners of the time would be very familiar with the 'spotted fever' which also takes some time to develop, Howard was clearly describing an epidemic of extreme toxicity and capable of leading to rapid death. This would suggest that there was widespread serious bacterial toxin. Within this framework only two conditions can be seriously suggested namely the preformed toxin Staphylococcal or Salmonella 'food poisoning' or the toxin of botulism. This certainly is in keeping with the hypothesis of Dr. J.J.Keevil.^{9.7} Both poisons are capable of causing death within forty eight hours particularly in undernourished men. It would require the bacteria to multiply rapidly and that all had been subjected ingested contaminated food at or about the same time and thus also likely to be from the same source. These clinical requirements suggest that the providers had supplied grossly contaminated food. In late August, it could be that the ambient temperature might have been favourable for bacterial growth.

The extent of the mortality from this illness combined with the likely poor state of the men can be judged by the death rate on the 'Bear' one of the Queen's five great ships. The reports by Hawkins show that 740 out of the complement of 1,000 men, that is 75% of the men were dead or seriously ill.^{9.8}

Keevil describes the process of food preparation at sea:

The oven or hearths were built of loosely spaced bricks, lying open in the hold on top of the foul, bilge-soaked gravel of the ballast. The atmosphere was putrid, and constantly humid; every article of food capable of growing whiskers grew them.

If these were the conditions of food preparation in the navy, it must be assumed that 'cookhouses' in the army would be little better particularly in winter.

The sicknesses experienced by the army of Elizabeth in Flanders would mimic those that might be expected in any wet boggy fighting terrain with minimal provision for disposal of human waste and lack of knowledge of hygiene. The addition of malnutrition and lack of dry shelter in the winter months would make respiratory disease almost universal. Certainly from the nature of the 'medicines' outlined by William Clowes, many of which may have eased cough; it would seem that this was the case. Gangrene, frostbite, and vitamin deficiencies could be added to the diseases of massed populations. Boils, skin diseases and parasite infestations both of the hair and the bowel would be expected. Infectious hepatitis, typhoid, typhus, tuberculosis, diarrhoea of all aetiologies would be found. It is likely that the barber-surgeons and their assistants would be quite familiar with these sicknesses, as they were commonplace in the Tudor years in England and Ireland.^{9.9}

The lack of basic hygiene encouraged the presence of rats whose fleas are the carriers of the organism *rickettsia mooseri*, which can give rise to the epidemic typhus. The endemic typhus caused by the *rickettsia prowazekii* is carried by body lice and thus always a hazard to soldiers unable to scour themselves and their clothes.^{9.10} Typhus was well known to the practitioners of the 16th century in England. It was the cause of the 'gaol fever' epidemics in England, in particular at 'The Black Assizes' of Cambridge in 1522, the Oxford outbreak in 1577 and the Exeter epidemic of 1589. Every practitioner in Elizabeth's army would have some knowledge of typhus. The recognition of the role of the body and head louse was reflected by the use of the 'curry-combs' used by Elizabethan ladies but it was probably used too by bearded men for beards. Pubic hair in both sexes needed attention.^{9.11} In the sixteenth century, there were no drainage systems in most towns and cities; the dwelling houses had straw or rushes as floor covering which may have assisted for warmth but would be liable to be full of vermin if left foul. Erasmus described the English cesspits as being sinks of filth and infection.^{9.12} By far the most formidable epidemics involving an army and also civilian population was the plague and syphilis. A mercury compound, usually cinnabar, applied by ointments was the mainstay of therapy for syphilis.^{9.13}

Public health as a responsibility of a fighting force in a foreign country was not clearly identified by the army or by physicians as part of their duty during the Elizabethan era. Only two treatises here had been published in the sixteenth century dealing with military hygiene, Godin wrote in 1558 a small paper on the topic and there was a major work by Anton Schneeberger in 1564 'de Bona Militum Valetudine'. In 1544, an order had been made under Henry the Eighth 'prohibiting carrion, filth, or other unwholesome or infectious, stinking thing to be near lodgings and the same to be buried'. As the order appears to recognize that the materials may have been infectious as well as offensive, it must be classified as recognizing health consequences.

Elizabeth's army was involved in small sieges in Flanders and at that time heavily walled towns were thought to give the best protection against the growing power of the firearms and cannons. In 1552, at the time of the siege of Metz, the ratio of sieges to battles was 2:1. An analysis of the results of sieges in the first half of the sixteenth century, showed that of fifty seven besieged towns only twenty four were carried by assault, twenty capitulated, three were relieved and the remainder were abandoned. Famine and disease took a huge toll of both besiegers and the besieged.^{9.14}

The siege of Metz in 1552 by Charles the Fifth was one of the great pivotal points in public health and its lessons should have been learnt by every military commander. The results obtained by the Duke of Guise, the commander of the besieged garrison, became the subject of great admiration particularly among the soldiers and a ripple effect must have passed through armies although this is hard to document. It would appear that both troops and officers of the French, Spanish and English armies commence to adopt changing attitudes to the welfare of their troops.

During this siege, Guise initiated basic hygiene measures by ensuring a clean water supply kept under guard, adequate food which was rationed systematically, disposal over the fortress walls of all carrion and body wastes and immediate isolation of the ill from the healthy. The Barber-Surgeons of the nobles were required to treat all that required their services. It was the

duty of the pioneers to clean the city streets and drains. There was no serious outbreak of epidemic disease in Metz during the sixty-five day siege.^{9.15}

The defence of Metz became the marvel of Europe.^{9.16} Following the lifting of the siege, Guise and Alva established a 'Red Cross' type of arrangement that allowed for better treatment of prisoners. Until this time it was the fashion to put to death any prisoners other than those for whom a ransom may have been expected. Guise introduced the concept of compassion towards any prisoners-of war. Compassion to the enemy was demonstrated in 1553 by the Spanish to the French at the siege of Therouanne. Similarly at other sieges including the Havre siege of 1563 and at Thionville in 1558, compassion was extended.^{9.17} Guise had introduced a new era in building up troop morale and loyalty maintaining a sense of ethics, treating both the enemy and his own forces.

The army of Charles the Fifth was huge, 220,000 men made up of twenty seven Spanish companies, and sixteen Italian companies and had within it 10,000 cavalry and 7,000 pioneers. They suffered a death rate of about 10%, 20,000 men in his army died mainly to dysentery, scurvy and typhoid.^{9.18} This compares with less than 6,000 persons dying within the city during the siege. Guise had only a small military force of twelve companies of between 4,500 to 4,000 infantry, and also 444 horsemen and three companies of gendarmes, totaling a further 920 men.^{9.19} During the siege, Ambroise Paré, was smuggled into the besieged city. He was requested to come to Metz by Guise as the death rate among the wounded in the garrison was very high and was thought to be due to be due to poisoned drugs being employed on the wounds. This idea was quickly put to rest by Paré who said the wounds were severe and the cold weather extreme. Paré in his book 'Journeys in Diverse Places' wrote an account of the siege. It is likely that many military professionals would have known of the events.^{9.20} Paré was welcomed in Metz by a civic parade. It is clear that his reputation was widely known among the soldiers illustrating the power of the word of mouth among the military.

The retreat of the army of Charles the Fifth from Metz allows some understanding of the contempt that was shown to the dead. Guise's troops after the withdrawal found that the Spanish had left their own wounded in their abandoned camp and had left the dead unburied. The road was filled with dead thrown to the ground by the cart drivers who commented that they were not paid to 'drive dead men'.^{9.21} Guise also arranged that the Spanish ill were able to be transported to medical centres by boat, a common sense approach but previously not used, but surely one which should have been utilized by the English forces in the Netherlands.^{9.22} (Leicester transported the wounded Philip Sidney by this method).

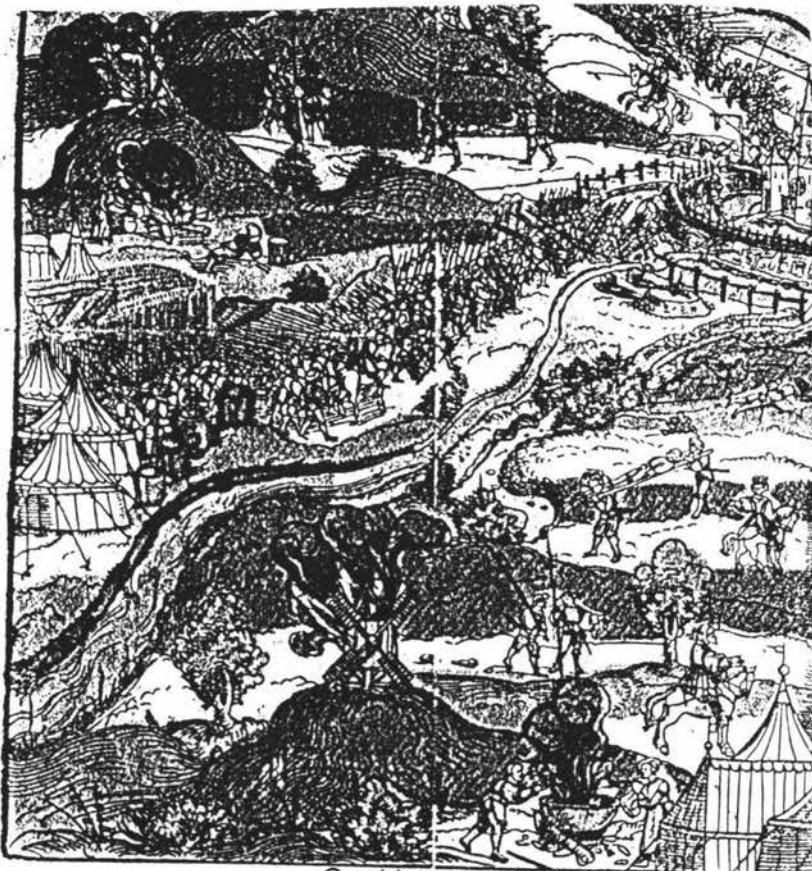
One of the means by which rumour and news of special events may have been transmitted was by the plays and tale-tellers, the troubadours and strolling players. Leicester came to Flushing with his players that he had supported in London. They would be aware of the local conditions and were likely to carry tales of the situation of the garrisons to whichever sites Leicester was to visit. If conditions had been bad, the morale of the men would have suffered, whereas good news would have been welcomed. Word of mouth among troops boosted Paré's fame, so too it is likely that the troops knew about the success of the siege of Metz and the introduction of a changed philosophy towards the enemy.

The lack of understanding of basic army hygiene was not confined to the English army. The acclaimed European forces appeared little better. A woodcut by Erhard Schoen^{9.23} depicts the siege of Munster in 1535, it clearly shows a soldier defaecating under a tree, (figure18). This lack of primitive hygiene is shown also in the scene of the Netherlandish Proverbs, 'The Blue Hood' painted in 1559 by Pieter Bruegel with similar public defaecation occurring, apparently into some type of ditch or soil latrine, (figure19). In England, the civic authorities did not understand the need for sanitation. An example can be quoted from the St. Bride's death records in 1598 in London. A young woman was recorded dying in the town ditch while fetching water, this same town ditch supplied water for domestic use was also used served the privies.^{9.24} With this type of lack of care in the city of London, how could



Cannons and powder barrels

Public defaecation



Stretcher bearers

Cooking cauldron with woman assisting

Figure 18 An army camp scene by E. Schoen, c.1532



Figure 19 Village latrine, from 'The Blue Hood'
By Peter Bruegel, 1559

the need for hygiene be expected to be accepted as desirable among the English troops whose hygiene concepts would be those conducted in their own homes and villages at home? Their understanding of the events at Metz would have been limited although the improved survival of the troops was likely to be known, if not the reasons for it.

Leicester in his disciplinary code however does include the item 44. The order stated that beasts were not to be slaughtered within the camp or garrison. The code also stated:

Nor shall suffer the garbage to remain unburied, neither shall any man trouble or defile the waters adjoining, but in the lower part of the streame some good distance from the Camp, under the payne of imprisonment.

The soldier also had orders not to 'ease himself or defile the Campe or Toune of Garrison, save in such places as is appointed for that purpose', this was found in item 45 of the codes.^{9.25}

Whoever drew up these items in the code was more cognizant of military hygiene and introduced those elementary features, which could help ensure cleaner water and possibly fewer flies and vermin.

Another factor, which must have had a telling effect upon the troops, was that the Flanders campaign was commenced in mid-winter. No comment is made in available documents about the provision for fuel for the troops but neither firewood nor coal was common fuel in the Netherlands. Peat filled this role but it had to be cut and dug from the peat areas of which many were flooded because of the defensive value of bogs and water. Peat needed to be purchased and money was scarce for the troops. The Maritime Provinces, Zeeland and Holland were wholly surrounded by water, in many places artificially contained by the huge dike system. One English commentator is said to have called Zeeland and Holland, the Great Bog of Europe.^{9.26} In 1570, great storms and high tides destroyed several of the sea-dikes flooding

vast areas of Maritime lands. The relief from a Spanish siege of Leyden by the forces of Orange also called for the flooding of large areas of arable lands by breaching dikes. In 1575, the University of Leyden was founded to commemorate this deed.^{9.27}

Contamination of food by cockroaches, flies and rats under field conditions would be almost impossible to control even if the camp cooks recognized their potential for disease transmission. In the illustration of the campsite outside Münster, the food is being prepared in a boiling cauldron and would be certainly suitable for human consumption. Transmission of infectious bacteria is much more likely to be from putrid water drunk from the local streams and dikes. The lack of basic hygiene would have encouraged the presence of rats whose fleas could multiply within the straw, palliasses or blankets upon which the troops slept. The inability to carry out even elementary body washing and cleansing would encourage body lice and the rate of transmission to a companion would certainly be increased if sleeping quarters were cramped. Epidemic typhus caused by the *rickettsia prowazekii* is carried by body lice and thus a hazard to soldiers required to wear the same uniform day after day. The body becomes sweaty and liable to itch, and by scratching rubbing the faeces of the infected louse into the broken skin.^{9.28} Typhus carried by the 'rat flea', murine typhus, may be transmitted also from mice. Both forms of typhus have rash and early debility with fever as their symptoms. Each is a major illness and would make men ineffective in battle.

Leicester in the Flanders campaign had developed rules regarding the presence of women among the troops but these could only be doomed to fail, as camp followers were so much a feature of army life. Leicester's disciplinary code, number 5 states:

And for that it often happeneth, that by permitting of many vagrant idle women in an armie, sundry disorders and horrible abuses are committed: Therefore it is ordeined that no man shall carrie into the fielde, or deteine with him in the place of his garrison, any woman whatsoeuer, other than such as be knowen to be his lawful wife, or such

other women to tende the sicke and to serve for launders, as shall be thought meete by the Marshal, on paine of whipping and banishment.

9.29

Virile men bored from their military duties, with money to spend, involved in drunken bouts would be easy prey for the tavern gamblers and whores.^{9.30} In the army of Charles the Fifth at Metz, the camp followers outnumbered the troops, for whom they provided all types of services, provision of food, laundering services, repairing weapons, armour and uniforms. If Charles's army were 220,000 strong, it would seem that together with the followers, the group would have been as big as the population of a large town. It appears that they plundered farms and stole food. In Flanders, with Elizabeth's army, similar followers would be expected to have followed the troops however probably in much smaller ratio as the troops had had effectively no money to spend on luxuries for many months

On the Spanish side, Phillip the Second in 1570 tried to influence the local councils in regard to the controls of brothels. They were to be visited on a weekly basis by a physician and a surgeon; the diseased prostitutes were to be sent to hospital for immediate treatment.^{9.31}

In Spain, in the towns, 'public health' was entrusted to the municipal authorities since the Middle Ages and vigorously guarded by them. The local authority set prices for food and its quality and for hygiene. Thus in Seville in 1582, with an outbreak of the plague, hygiene measures were put into place by the local authorities. These measures were probably well in advance of those known to the English, judged by the lack of order in London at the times of the various outbreaks of the 'Black Death'.^{9.32} The Spanish insisted upon the burning of rubbish and infected clothing, and commenced isolation of the sick. They instructed the citizens to avoid large crowd gatherings and they provided 'healthy' food.^{9.33}

Henry the Fifth is known to have left much of his force ill in Calais prior to the battle of Agincourt on 25 October 1415 due to dysentery or 'camp fever'

which may have been infectious hepatitis or typhoid or both. The fever resulted in the death of 2,000 men and 5,000 more were invaded home and others slowly recovered on site. When Henry had taken Harfleur, he settled his army for the winter. At this time one third of his army were dead or disabled by diseases.^{9.34}

‘The winter coming on and sickness growing
Upon our soldiers, we will retire to Calais’
Shakespeare, Henry 5th, Act III, Scene III.

During the battles, many in the army were likely to be suffering from diarrhoea and would have had to relieve themselves where they stood. The Men at Arms wearing mail leggings laced to their plate armor would have been unable to have defaecate freely. It is doubtful that men in this state could have been effective in any way in battle other than to give an illusion of strength to the enemy.

Henry’s army had twenty surgeons to attend to the wounds, mend the cuts and treat the fractures. One physician was also in the force. Henry had an army of 32,000 men; there were about 8,000 archers and 2,500 men-at-arms. In this army, the ratio of surgeons to men was 1 to 1600 and thus many less than the ratio of the Elizabethan army.^{9.35} The chief surgeons were Thomas Morstede of London and William Bredewerdyn. Neither is listed as an office bearer in the Annals of the Barber-Surgeons.

The first artists to produce engravings of battles in the Low Countries in which English forces may have been engaged were Dutch.^{9.36} Some images of the conditions can be seen in ‘A Highway Scene’ by Jan Bruegel the Elder (1568-1625) showing the highway to be a boggy track, four covered wagons are shown, each four wheeled, drawn by three horses, a lead horse with two yoked behind. A peasant or landholder is shown with a flat hat, baggy britches with a tie above the knee and a long thin sword as opposed to the classical German type broadsword as used by the soldiers on the Continent at the time. It is understandable how armies in Flanders were at times not able to advance further than three to five kilometers in a day’s march.

It is helpful to turn to the engravings by Erhard Schoen showing the 'Siege of Münster' 1534/5 to outline the schematics representation of a battle scene.^{9.37} The city, in the control of the Anabaptists showed fortified walls, deep ditches, and bunkers, cannons in rows, slings for missiles, further behind the rows of tents, some 'bell' shaped, some oblong, obviously depending upon the rank of the inhabitant. Behind all was the cooking and provision area, a woman is noticed working at a cauldron, (figure 20). A soldier is pictured defaecating under a tree. Schoen also depicts the marching order of the troops in 1535, (figure 21). The captain was on horseback, followed by two sergeants, halberders, followed by musketeers and lastly the pikemen. The first ranks were paid double as they were first into an engagement and usually the most experienced. The unit was known as a Fähnlein or literally, a banner. The German company usually consisted of 400 men and is contrasted with the English band of 100 men.

The army in the field was prone to all of the common diseases of society at the time but with the addition of the handicaps expected from starvation, close and unhygienic living conditions, lack of sanitation and food contamination. It is likely that in addition periodic mass drunkenness, alcohol-induced delirium would occur. Venereal diseases of all types but particularly syphilis would be found commonly. The basic principles of hygiene as employed by Paré do not appear to have been widely appreciated although whoever drew up the guide lines for camp conduct for Leicester's rules if implemented must have drawn upon experience and observation. The concept of codes of conduct appears to date back to those Henry the Fifth developed for his troops during the invasion of France; and to Henry the Seventh before the battle of Stoke. Elizabethan codes were developments from similar previous codes.^{9.38}

One of the initial objectives of the Army in Flanders was to attempt to relieve the besieged city of Antwerp. The initial levy of troops had been raised mostly from the estates of Leicester and arrived at Flushing on 14 September 1585. Flushing was one of the garrison towns that had been guaranteed to Elizabeth for her assistance in the Dutch wars.^{9.39}

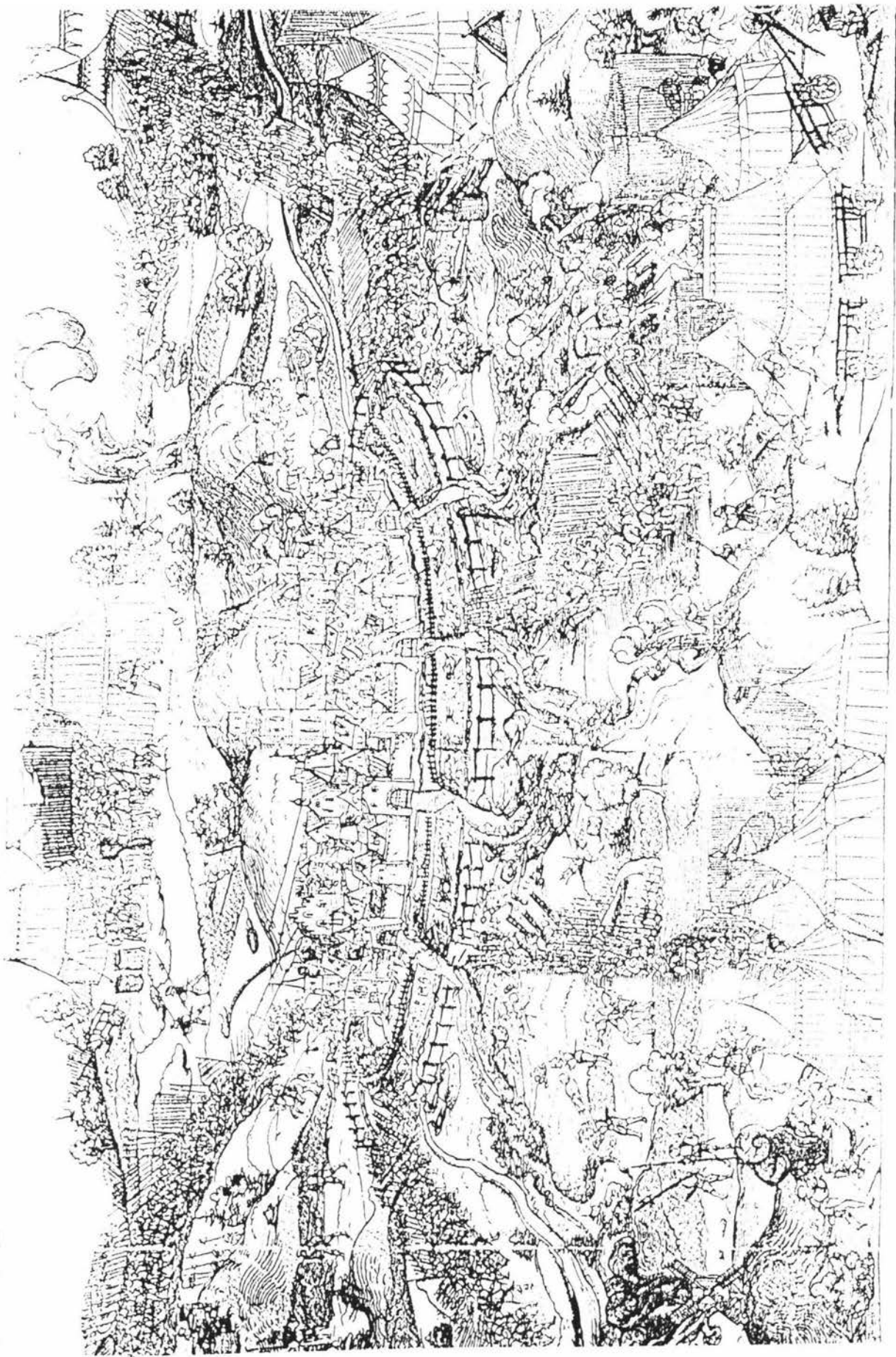


Figure 20 'The siege of Munster', By E. Schoen, c.1532



Figure 21 'A banner bearer and order of march',
by E.Schoen,c.1532

Leicester's original assessment of his troops as swaggering ruffians, common and inferior, from the disreputable haunts of London would not have included those who were recruited from his own estates. However the description of some of the men was reinforced by comments by Thomas Digges who was aware of their slovenly and squalid appearance. He hoped that Leicester could within a few months transform 'these weak, badly furnished, ill-armed and worse trained bands' into 'well armed, trained, complete, gallant companies as shall be found in Europe'.^{9.40}

Why were they described as common and inferior? As outlined before they were likely to have been malnourished and already close to starvation and vitamin deficiency prior to leaving England? Many of the men were probably ill and unfit and certainly not fit to attempt the hazardous crossing of the Channel in winter.

The fault lay very obviously with the regulations not being followed in London in terms of uniforms, arms and being fit and able. Perhaps the Privy Council and Lord Mayor were under pressure to have on Dutch soil a 'political army' as quickly as possible. The army, which had arrived in December defying the winter and its gales, may have allowed a political point to be made for Prince Maurice and for Leicester to highlight Elizabeth's determination to be a major military combatant.^{9.41} The arrival of the English troops apparently acted as an incentive for the Dutch to fight on.

Digges when reporting so optimistically to Walsingham on 12 January 1586 may have been reflecting his own lack of knowledge of training procedures. By December, there were 8,000 troops in the Netherlands, in the cold grip of winter without adequate money to buy fuel and also without adequate accommodation or food.

No comment is made about the medical practitioners in Digges's reports although it is recorded that many men were ill. Perhaps also the initial medical practitioners were poorly trained and ineffective in trying to improve conditions

and only able to deliver comfort to the 'sick' as they would have done in their home environment.

By March 1586, only four months after their arrival the 'paddy persons' referring to those men lying on straw, continued to be most destitute among the troops. The soldiers were said to be barefoot starving beggars in the streets. It was reported on the 18 March 1586 to William Cecil, Lord Burghley, and then Elizabeth's Secretary of State as follows:

My good Lord what English heart can without shame or grief hear the Flushingers reproachfully say, that even in their hardest estate, the soldiers of that town were always paid at least every 15 days end, whereas the same now being in H. Majesty's hands, her people there can get no pay in three months, so that they are almost driven either to starve or beg in the streets.^{9.42}

Leicester to his credit did extend money to the soldiers. He wrote to Lord Burghley:

I have let of my own more than I might spare, they cannot get a penny, their credit is spent, they perish for the want of victuals and clothing in great numbers, the whole are ready to mutiny. There was no soldier able to buy himself a pair of hose and it is too, too great shame to see how they go, and it kills their heart to show themselves among men.

He also pleaded to Walsingham stating that 'There came not one penny of treasure over since my coming hither'.

While these were the facts, it would be likely that Leicester should have given priority in distributing funds to the soldiers who were first at Flushing as these were raised mainly from his own estates. Leicester's comments about the soldiers whose 'hearts are killed to show themselves among men' would appear designed to appeal directly to the Queen bearing in mind his comments about them being worthless characters. It seems also that the

funds, which Leicester had given out of his own pocket, were distributed mostly to his own followers and the Gentlemen Volunteers.^{9.43}

It is a cause for speculation how many of the troops developed severe psychiatric illnesses with resulting suicides or severe dementia. Certainly severe malnutrition can lead to depression but not per se to dementia or mania. Of the vitamin deficiencies, B¹² may be associated with mania. Under the conditions of great stress, it is possible to initiate the clinical symptoms of schizophrenia with delusions and violence.^{9.44} The medical practitioners must have had contact with mentally disturbed persons in their home practices, treated no doubt by various methods but those who were violent would probably fall under the justice system of the area. The community of the time would accept these individuals as being under spells or being possessed by 'the devil'.^{9.45} Mental illnesses with their violent aspects requiring restraint within London led to the conversion of the ancient monastery (1246) of the Hospital of St. Mary of Bethlehem in London to an insane asylum 'Bedlam' in 1547. In the London records of death, suicide was thought to be grossly underreported. The parish register at St. Martins in the Field in London in 1586 recorded a 0.1% rate. Suicide was looked at as a sin and also had been made a felony, of little consequence to the desperate and depressed, starving troops.^{9.46}

What would be the state of mind of the soldiers in Flushing? They were starving, without adequate clothing, and untrained to meet any threat from the Spanish. Would they care? They at first were struggling to survive from the effects of the winter, the voyage and the early stages of starvation. Physically, starvation brings about sensations of weakness and irritability, emaciation is apparent, the feet and hands are cold, movements are painful due to muscle wasting and oedema of the legs develops which can be coupled with neuritis due to vitamin deficiency. Mentally a lassitude can develop beyond depression into a state of extreme apathy but even with semi-starvation intellectual performance is affected only minimally.^{9.47} It is doubtful that even if troop bands had been made up by the sergeant-major at this early phase,

comradeship could have developed to the point that mutiny about conditions could have been organized so soon after arrival.

The troops would have found out soon from the existing garrison about some of the exploits of their Spanish opponents and the atrocities which they had committed, if not by mouth then certainly from the propaganda posters that were commonly circulated. The reputation of the Duke of Parma as a military genius who had captured thirty previously loyal towns without any serious resistance being mounted would certainly be common knowledge. The Spanish under the command of the Duke of Parma appeared to be invincible. He had taken the key cities of Ghent and Bruges and in effect the Spanish had all of Flanders under their control except for Ostend.

They would discover that the English Garrison at Aalst had sold out to Parma for 128,250 florins paid in cash in February the previous year. They would also have found that Parma who had encircled Antwerp had constructed a vast bridge 2,400 feet long across the River Schelde to block any shipping from entering the great port.^{9.48} These victories could only help feed the depression of the garrison troops. Certainly the fear factor must have had a great effect upon these unfortunate troops.

Perhaps they may have taken a little heart to learn that the great bridge was blown up in an amazing feat by a floating mine exploded with a clockwork fuse.^{9.49} On the downside, despite five miles of defensive walls, the city of Antwerp surrendered without a shot being fired on 17 August.

The force defending Antwerp had a ring of fortresses below the city, garrisoned by Dutch militia, Scottish soldiers and an English regiment under Colonel Morgan who had a reputation as a soldier of great experience and courage but failed against the Spanish. Despite their courage, there was a mutiny among the English troops many of who deserted to Parma; of the others some escaped back to England.^{9.50} The treaty of Nonsuch, which had sent the troops on their expedition, had been signed three days after the fall of Antwerp on 10 August 1585.^{9.51}

The explosion of the mine on the river Schelde near Antwerp shows that pioneers or engineers and those with expertise with explosives were becoming part of the requirements of an army. Did the Honourable Artillery Company supply experts to the army of Elizabeth as well as undertaking their training duties?

The role played by fear and rumour within the armed forces on either side can be illustrated by the effects within the Spanish army of the explosions, which destroyed the great bridge at Antwerp. The two 'devil-ships' were converted into floating mines. Each contained over three tons of gunpowder compressed into well built brick chambers. One was to be fired by a slow match, the other by a clockwork device. The latter succeeded in exploding against the bridge, removing 200 yards of the bridge and killing 800 men and wounding many. The memory of the 'devil-ships' caused the Spanish to panic when fireships were drifted into the ships of the great Spanish armada when they were anchored off the coast of Calais.

To counter the negative thoughts that may have been generated in the minds of the English troops and their leaders, they would have had recounted to them the heroic achievements of the 'Sea-beggars'. In 1572, they had recaptured Brill and Middelburg and won a sea battle on the River Schelde, which effectively shut down trade up the river to Antwerp.

The veteran Dutch soldiers who had had experience of the Spanish troops could be expected to tell the newcomers of the terrible atrocities that the Spanish had inflicted upon their citizens. The fear factor must have been great among the new troops. Many examples were available to be recounted as occurring over the course of the Spanish invasions of the Netherlands, notably at Haarlem in 1573, Mons, Zutphen and Maestrecht.^{9.52} Perhaps none would be more vivid than the 'Rape of Antwerp' by the Spaniards in late 1576, (figure 22). The Spanish were tainted in the popular mind and called 'Spanish Bloodhounds', 'Spanish rabble', 'circumcised Moors', 'Marranos' and 'Pigs'.^{9.53} The Spanish Army of Flanders actually comprised very few Spaniards as it



Figure 22 A propaganda poster 'the Rape of Antwerp'
from Job, 1616.

was made up of mainly German, Walloon, and Italian mercenaries. In the 1570's the Spaniards made up only 15-20% of the total although a great percentage were of officer rank.^{9.54}

However not all mercenaries were 'thugs' as can be seen in the memories of John Schot written in 1587.^{9.55} Some of the mercenaries may have been the landsknechte (landspeople) or ordinary soldiers who had been trained with the two handed sword and other weapons. This group originally formed by the Emperor Maximilian the First were strongly religiously motivated, prepared to fight against 'Papists and Tyrants', they were an intolerant and fanatical Protestant group.^{9.56} Another mercenary group was the Doppelsöldners who were paid with ample pay, the term Doppelsoldner literally meaning the 'double pay men'. The nearest equivalent to these were the English 'Gentlemen of the Company' or lesser nobles.

Despite of the poor situation overall in the Netherlands at the time of their arrival in Flushing on 14 September 1585, the English army did have some early morale building success at the end of winter. On 6 April 1586, an Anglo-Dutch force under John Norreys relieved the town of Grave routing a larger Spanish force and leaving five hundred Spanish dead. They also collected a useful quantity of food. The Flushing garrison had survived through the winter probably without adequate food despite the efforts of the administrators to cover costs and to pay the troops. The depression and the atmosphere of 'doom and gloom' may have lifted with action and certainly with success.

The second action that could have improved morale took place ten months after the first English troops had arrived in Flushing. The English force had been reinforced from time to time but there appears no reason to believe that these troops were any better in health or equipment than those who came originally. In July 1586, Sir Philip Sidney led an attack on Axel. He swam the moat in the dead of night with forty men, scaled the walls and opened the gates to his forces. The city was captured and four neighbouring cities capitulated to the English. Sidney opened the dykes and flooded and made impassable the surrounding countryside.^{9.57} Morale of the troops would have

been lifted greatly by such leadership. This action involving by Sidney shows that despite the general worthlessness and untrained nature of the levies from England, there was a hardened cadre of veterans and Gentlemen Volunteers, who could contribute enthusiasm and leadership. It was thought that if the English forces were properly equipped they could give the Spanish a significant struggle in the future. Walsingham however recognized that Elizabeth did not want a prolonged war and did not want to spend any more money on properly fitting out the army.^{9.58} This fact of course was not known to the troops.

Disappointment was not far away. The English Army by September 1586 had sufficient able and fit men to mount a small campaign. By this time they had had nine months to overcome the initial misery and perhaps to revive military enthusiasm. The English force moved inland and captured Duisberg, they regarded this as a preliminary action before going on to capture the important city of Zutphen. Henry Norreys, a very able commander, complained that of the five hundred horses promised only two hundred arrived. The reason for this is not clear but again it must be a matter of speculation if the animals actually were in Flanders or once again had there been fraudulent reports? Some artillery moved with the force but the guns were so unserviceable that three or four of the best pieces broke down after firing only a few rounds.^{9.59} Norreys arrived outside the city on 13 September and commenced its siege. On 21 September, they received news that Parma would attempt to relieve the city, the English force of five hundred men and fifty volunteers including Lord Essex and Sir Philip Sidney set off to challenge them. They left before dawn in mist, and as they progressed, the English group found themselves facing three thousand Spanish troops. The English made a charge with fifty cavalry with some success against the larger force who had the advantage of being armed with guns. The Spanish went on to relieve the siege of Zutphen.

In the action, Sir Philip Sidney was wounded in the thigh. Leicester put him in his own barge for transportation to Arnhem, his headquarters at the time. His wife, then heavily pregnant, came from Flushing to be with him. The

wound was not a major wound however at the end of sixteen days it was apparent that the wound was putrid. He died nine days later, probably from septicaemia (blood poisoning) the most likely complication of an open wound.^{9.60} It is of medical interest that his embalmed body was taken back to England, for who would have had the skill and resources to undertake embalming? His transport by barge shows that this option for evacuation of the wounded may have been used at other times.

Even the most distinguished casualties among the leaders were subject to 'the best available' medical surgeons. Thus at the time of the wounding of Sir Philip Sidney^{9.61} at the battle of Zutphen, some of those who attended to him were regarded with mixed feelings. Some were said to have shown 'some mercenarily out of gain, others out of honour of their art, but most of them with a true zeal (compounded of love and reverence) to do him good, and many nations in him'.^{9.62} These high words of praise were most unlikely to have applied to the ordinary wounded soldier. As William Clowes was appointed to attend to Leicester it is quite possible that he was one of the attending surgeons but did not record this in his military writing.

The use by Sidney of cavalry shows that there were horse handlers in the army. They almost certainly had to double as ordinary troops. If cannon were to be drawn, the horses needed to be plentiful. A heavy gun required a score of draught horses to drag it and a dozen men and horses to carry its ammunition, (figure 23).^{9.63} Perhaps in Flanders the use of barges was a worthwhile undertaking for gun transport and the fodder for the horses?

In November 1586, Leicester was called back to England to take part in the debate about the execution of Mary, Queen of the Scots. In his absence he left two field commanders, Sir William Stanley and Rowland Yorke, who by incompetence or betrayal, in February 1587, allowed the surrender of the City of Deventer and the fort of Zutphen and other outposts to the Spanish by its Anglo-Irish garrison.^{9.64} Leicester had previously described Stanley as 'worth his weight in pearl' once again showing Leicester's inability to recognize the abilities of his commanders.^{9.65} This disaster occurred in middle of a

Scharpff Hirtz.

Ich bin genant der scharpff Hirtz
Wo ich zu einem Schloß ein Dietz
Stoß ich nyder mit meyn gehün
Doll werd maner puschwer vñ thün
Heter vñ Zynnen fell ich nyder
Kum ich zu dreyen malen wyder
So wüde das schloß von mir erschelt
Das es über den perg ab fellt.

Scharpffe Metz.

Ich bin ein scharpffe Metz genant
Wo ich wurd in ein Satt gefant
Do thut ich liden Qualen liden
Durch rüchma we zwinger vñ schans
Durch tuchel hauser steller tuchel
Geweld stuben samma thut ich tuchel
Vnd was mich jett am wyderpalen
Das hüß ich so das es müß fallen.

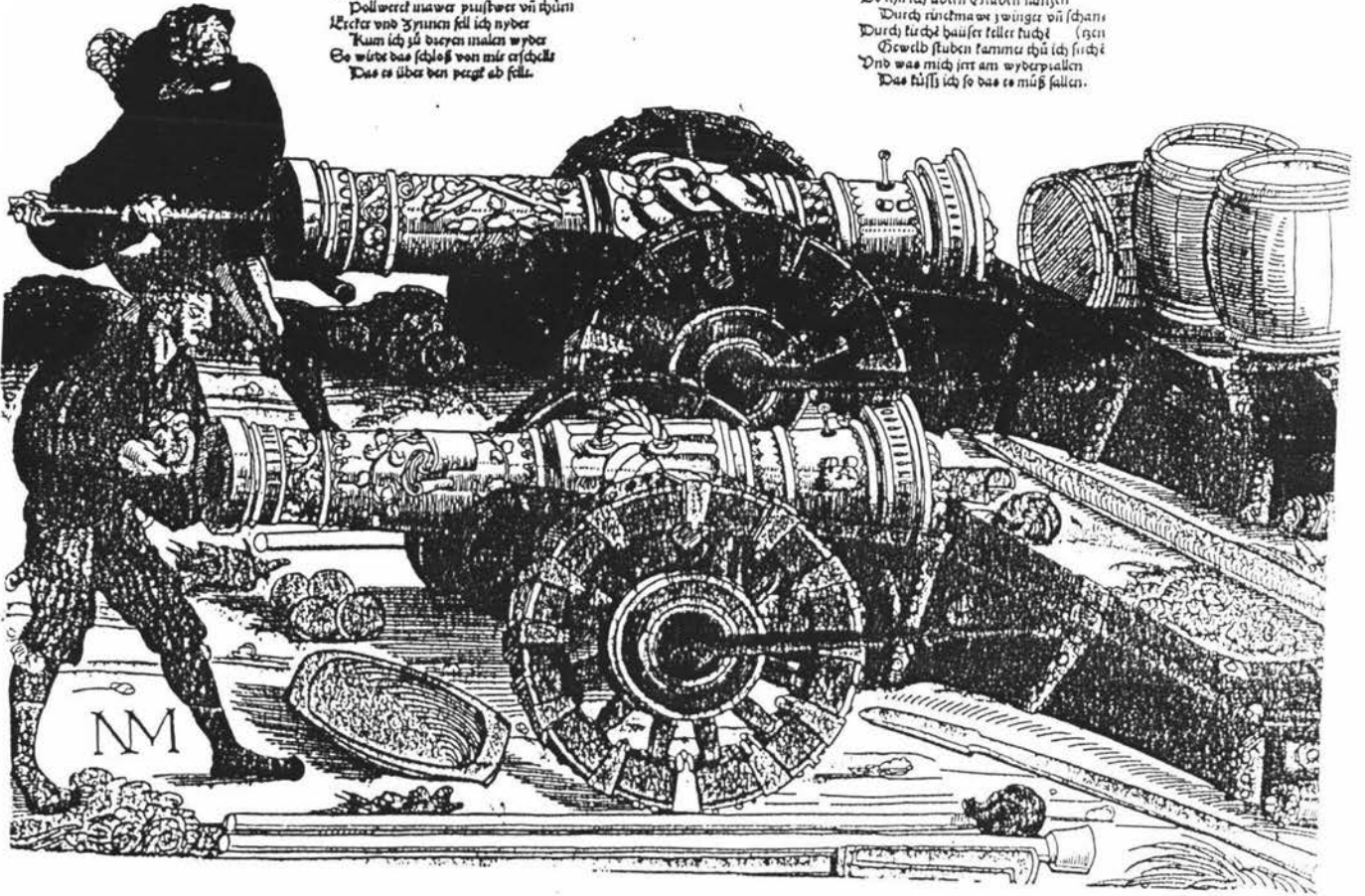


Figure 23 Illustration of massive cannons and powder barrels, by E.Schoen,c.1532

particularly severe winter. The English land campaign had suffered its most famous and calamitous set back. This loss would cause the morale of the troops to another low as only the previous year the English force was sufficiently organized to have laid siege to Zutphen.

It would seem that Sir William Stanley, the senior commander, had 'sold' Deventer to the Spanish. English/Irish garrison, lacking pay, starving and tired of the Dutch, submitted to the 'golden bullets' of the Spanish. The loss of Deventer was a huge blow to the Orange cause. Within the Provinces there were many areas, which were deeply suspicious of Leicester, and the loss of Deventer became a rallying call to the non-Orange group. 'Remember Deventer', became a political slogan to those opposed to the Orange group, Thus 'There grew a wonderful alterations in the hartes and affections of the people againste the Englishe. They uttered lewde and irreverent speaches of His Excellencie and the whole nation' ^{9.66}

In the summer of 1587, Parma took the deep-water port of Sluis by siege and soon after in December 1587, Robert Dudley finally left the Netherlands. However he did not relinquish his command until 1588. The command of English was left to Sir Francis Vere and Dutch forces under Prince Maurice of Nassau who had been appointed one of the three Stadholders in 1585 at the very young age of seventeen.^{9.67} Leicester was disillusioned by his dealings with the States-General of the Netherlands and was in disfavour with Elizabeth.^{9.68} He was also in poor health and this is confirmed by his death on 4 September 1588 within a year of from an illness that caused stomach pains. A postmortem was conducted to remove any suspicion that he had died from poisoning even administered when in the Netherlands.^{9.69} It also demonstrates that Leicester did not enjoy the confidence of a group of persons in England. It supports the contention that there was a powerful anti-Leicester group that opposed his appointment to Elizabeth's army and his role in the Netherlands. No doubt many of the captains were aware of the circumstances and may have been actively anti-Leicester. Captains who were not loyal to their commander would certainly be likely to have an adverse

effect upon the troops under their command and a decision ruling out death by poisoning may have reversed some of the possibly concealed animosity towards Leicester.

Prince Maurice took over the command of the combined English/Dutch forces officially in 1594. Maurice and Sir Francis Vere rebuilt the English army after Leicester's departure and subsequent death. The English rabble of 1587 was transformed into an efficient fighting force based on good leadership, food and pay. The new army had a regiment structure as advocated by Sir Humphrey Gilbert in 1572. The pikemen and musketeers were trained to support each other and troops of horse armed with pistols or carbines on the reiter model (German). Vere was appointed Sergeant-major-general in August 1589^{9.70} after Leicester's departure from Flanders. The English performed with great success at Turnhout in 1597 and Nieuport in 1600. The army was transformed from a rabble into regiments of brave and skilled force, (figure 24).^{9.71}

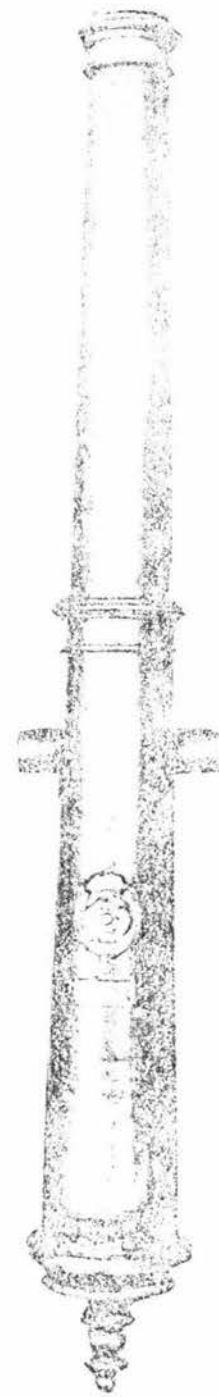
As one of the medical practitioner's duties was to visit the sick, it raises the question about where they were quartered. Were they allowed to stay in billets? Was there a special tent in the field as was the case in the Spanish force of Charles the Fifth? Did the garrisons employ isolation areas, as was the practice of Guise at Metz? Nurses were allowed under Leicester's orders which suggest that sick men were segregated as unescorted females were unlikely to be allowed to roam in the garrison particularly if they had been possibly recruited from among the camp followers. In 1585 when the expedition had settled into the garrison towns in the winter in the Netherlands, it was said that evil feeding, cold and wet bedding had caused much sickness, but fortunately most men had recovered. It was reported that over two hundred men were in hospital but it is unclear what is meant by that term.^{9.72} In Ostend, in 1587, the governor of the garrison asked for special rations for the invalids as in nearly every case, they had fallen ill through eating bad food. He felt that it was impossible for men to recover from sickness or from dangerous wounds by having only stale cheese and unwholesome bread to eat. It is possible that he acted on the advice of the medical practitioners.^{9.73}



Sir Francis Vere.
 Woodcut from "The Commentaries of Sir Francis Vere"
 published in 1657.



'A Yeoman of the Guard attending Queen Elizabeth on a progress'. c.1570
 Engraving after S.Hooper from Francis Grose, 'Military Antiquities', 1786.



Bronze Cannon (Saker) dated 1538.
 Cast with a crowned Tudor Rose within
 the Garter and incised with the names of
 Henry VIII and the brothers John and
 Robert Owyn of Houndsditch, the makers.
 Royal Artillery Museum, Woolwich.

7111-10

Figure 24 An illustration of Sir Francis Vere, a bronze cannon
 (1538) and a Yeoman of the Guard (c.1570). From Barthrop, p.14

However that concern for the men and their recovery was entering the minds of the commanders demonstrates that in the two years from the time of onset of the European campaign, a new 'mind-set' was developing. Was this because of more humane attitudes towards the sick and the ill? Or was it due to the acute need for fit men in the garrison?

A system had developed in the Netherlands, which allowed private houses to act as 'guest-houses' for the invalids. It appears to have worked well as the Netherlands was thickly populated and numerous houses could be found. The owners were made responsible for looking after a number of sick men and reporting on their condition at regular intervals to the muster-master and the treasurer-at-war. The rate of pay for the attention and who paid is not clear, for much of the cost was expected to be paid by the soldier himself and some from the army.^{9.74}

Following the retirement of Leicester from the Netherlands in December 1587, Elizabeth's army in Flanders became the 'forgotten army.' Between 1588 to 1591, no further troops were sent to the Netherlands.^{9.75}

Did Elizabeth know about the condition of her army in Flanders? Did she care? Certainly she was informed but as to her concern for the men the question must remain unanswered. She did comment about their pay problems and cheating by the captains and instructed Leicester to inform her and she would deal with it. She said, 'it frets me not a little that the poor soldiers who hourly venture life' should be cheated.^{9.76} Even Cecil (Lord Burghley) raised a doubt about the general feeling of the men towards 'Bess' noting in November 1587 that many had begged their way to England and even to the gates of the palace and exhibited their wounds and their misery before the eyes of that good Queen Bess who claimed to be the mother of her subjects, and begged for bread in vain.^{9.77}

Wilkes reported to the Queen in February 1587 on the condition of her troops in the following report:

The soldiers had become mere famished, half naked vagabonds and marauders, forlorn and crippled creatures swarmed about the Provinces, but were forbidden to come through the towns, and so wandered about robbing hen-roosts and pillaging the peasantry. Many deserted to the enemy.

The entire Army, troops, specialists, medical practitioners were in a terrible state after Leicester's departure. Although Queen Mary had raised the rate of pay for the recruits from six pence per day to eight pence this would be of little use if there were no food to buy.^{9.78} The Queen was kept informed about the progress of her army in Flanders by Leicester but it appears that she was not satisfied that all was well despite his assurances. Elizabeth asked Leicester repeatedly for reliable accounts but did not receive them.^{9.79} She elected to send a representative, Thomas Wilkes, to the Netherlands to report as he found the circumstances. Specifically Wilkes was dispatched by the Queen to supervise the accounts of the army in an attempt to stop the fraud that was robbing of the troops of their pay. Thomas Wilkes was a Clerk of the Privy Council of England and responsible for reports to that body whose effective administrative head was Secretary of State, Walsingham. Wilkes also frequently addressed reports to the Queen and to her Commander-in-chief in the Netherlands, the Earl of Leicester.

Leicester had lived extravagantly and on his arrival in Flanders had increased the pay of all officers including his own.^{9.80} Leicester increased his pay from £6 per day to £10.13s.4d and added an annual increase of £1,715 for the army expenses^{9.81} but the troops were not paid. Following the removal of Leicester, the financial situation deteriorated even further, and no money was sent from England at all. In February 1587, Sir Thomas Sherley, the newly appointed treasurer-at-war, took only £5,000 to the Netherlands and of this miserable sum £2,000 was taken by the 'cautionary' garrison towns. In contrast, Leicester had been sent over £140,000 in less than a year.^{9.82} Wilkes, writing to the Queen, Leicester and to Walsingham on the 12 March 1587 recorded these details but also outlined that the general troops (non-garrison) had not been paid for five months. Leicester had left the Netherlands

in December 1587; thus failures in the pay system had become critical as early as October 1586. The troops were facing still yet another winter without the means to sustain themselves.

The English troops were demoralized through lack of pay and the consequences of the Deventer disaster. The Dutch reaction to the loss of Deventer coupled with the general loss of confidence in the English and their behavior was so marked that many of the towns garrisoned by the English were considered to be in jeopardy and all other towns refused to open their gates to them. In other towns mutiny and defection occurred, at Zwolle, Arnhem and Ostend showing the desperate plight of the troops.^{9.83} In the midst of this crisis, the Prince Maurice and Count Hohenlohe threatened to cut to pieces any English cavalry that were found within the limits of the Province of Holland.

The men in the garrisons in the 'cautionary' towns fared poorly but not as badly as those whose duties were in other places. As Thomas Wilkes stated, 'they were poorly accommodated and supplied and took out their frustrations on the local populations with predictable results'. Wilkes was also an English member of the raad or the Netherlands' parliamentary equivalent at that time. Certainly the influx of refugees from the south had made accommodation very scarce, from 1584, 38,000 people were estimated to have emigrated north in particular from Antwerp.^{9.84} Leicester applied an edict restricting river barge trade that had the effect of paralyzing or diverting the trade from which the Netherlands had gained considerable income. One other effect was to depress rural food prices, which should have assisted the English forces to obtain easier access to food. This was very little comfort to the troops who without ready money and credit were not able to buy food even at depressed prices.

Thomas Digges, a civilian, was the first muster-master in the army in the Netherlands and was considered to be honest. He attempted to stop the greed of the military captains, many of whom were in the army primarily to make a profit by cheating from the pay designed for the troops. He also

examined the poor state of the equipment and the mounts of the men particularly those of the men incapacitated through sickness or wounds. He went so far as inviting the soldiers with grievances to come forward and lay information against their officers; this effort to control the irregularities caused such bad feelings among the captains that mutiny was narrowly averted by abandoning the idea. He also suggested that because of the scattered nature of the garrisons, there should be deputies in each of the sites. However this still failed to stop the pay problems of the troops, possibly because the appointees were less honest than Digges. Thomas Digges who died about 1571 had compiled a pocket book for army officers and medical practitioners: 'The Duties of a Surgeon of a Bande'. His son Thomas did not issue the book until 1590, after his death, possibly because of his criticisms of the current army practices that were still occurring at the time.^{9.85}

The troop's physical strength was very poor due to illness and malnutrition. By having insufficient food and clothing the men's vitality was so impaired that sixty per cent of the sick or wounded succumbed. There was little the medical practitioners could do to alleviate starvation. In this way and by desertion they were so reduced in numbers that, excluding the garrisons of Flushing and Brill, Norreys declared that he did not have three thousand men in the Queen's pay in 1587. Notwithstanding this state, Elizabeth in June 1588 called for some troops to come back to England in the face of the imminent Spanish armada.

The two new leaders, Prince Maurice and Count Hohenlohe, did have one success at Battenburg with a mixed group of troops; those English troops who were at this battle showed their lack of military discipline by throwing away their arms as the Spaniards were fleeing.

Van Buchell's ^{9.86} commentary before the Estate-General may be apt, 'So many of our girls and women are given over to foreigners, the Spaniards have tried the virginity of a good number and the haughty English have deceived many of them'. Doubell writing later in 1654 of the events in the Netherlands

declared: 'that the abduction of young daughters were not rare occurrences many being as young as thirteen years'.

Additionally Wilkes wrote 16 February 1587 about the lack of pay, and that the troops were:

Committing daily upon the villages and people extreme spoils, insolences, and mischiefs that has drawn our nation into the hatred of this people very deeply, so they are for the most part turned out of towns, and refused to be taken into garrisons.

Wilkes' cautious words, 'spoils, insolences and mischiefs' imply that goods were seized by force, violence, pillage and in all represented evil and harmful conduct.^{9.87} The discontent of the troops at times caused mutiny, defections to the enemy and desertion, however the mutinies were never a real threat to the conduct of the war as the troops were small in numbers and scattered over the Netherlands.^{9.88} The main exception was the mutiny at Ostend in 1588 caused by lack of pay, unsatisfactory food and the natural physical discomforts of the town. This mutiny rumbled on for over a month and led eventually to execution of thirteen 'ring-leaders'.^{9.89} The governor had tried to improve the conditions of the sick in 1587 but obviously the supply problems continued.

The payment of the troops and the irregularity of receiving pay related in great part to the system of passing on the Crown's money to the soldiers as well as to the number of frauds perpetrated. The troops were supposed to receive only a proportion of their pay week by week, the balance being paid at intervals, usually six months. Each week, the treasurer-at-war issued to the captains the amount of advanced pay to which their companies were entitled by the last muster roll. The payment was checked by the 'clerk of the check' who was required to cooperate with the muster-master and the treasurer-at-war in the Netherlands. Account books were supposed to be made up twice a year in duplicate; additionally a third set was required for the Dutch who were nominally duty bound to support the English financially.

Thomas Digges acted as an independent auditor, and the comments in the text by Cruickshank, commend him as being diligent.^{9.90} The system did not allow for pensions to be available to widows or dependents and the Crown pocketed any deferred pay. The irregularities were however substantial. Obviously, it was to the captain's advantage to claim more men on muster than existed, so dead men were still counted constituting a 'ghost army'. Into whose pockets the sums passed appears to have been agreed within the various companies. Heermale reporting to the Privy Council stated, 'Experience has shown that good musters are impossible if warning is given beforehand' ^{9.91}

The initial treasurer-at-war for the Netherlands was Richard Huddilston but in 1585, Sir Thomas Sherley who held the post and other financial posts for ten years replaced him. Sherley was reputed to have received a payment of £4,000 per year from legitimate sources and what he obtained from other sources can only be guessed at.^{9.92} Initially Huddilston carried money in person to Middelburg and obtained in local currency the best rate of exchange possible. Subsequently the Merchant Adventurers Company was enlisted to supply money to the garrisons at Flushing and at Brill and this scheme appears to have been somewhat more successful for the troops.

Wilkes wrote the following report, on 19 January 1587 to Secretary of State, Walsingham, which appears also to have been copied to the Earl of Leicester on the 12 March 1587:

' So great is the lack of discipline among the garrisons, especially of our nation, that I am ashamed to hear the continual complaints which come to this council against them. And albeit Sir John Norris and I have written often unto to the captains and governors to see reformation of the insolences and disorders of their soldiers within the towns, it is notwithstanding so slenderly respected as there followeth no amendments at all; so we begin to grow as hateful to the people as the Spaniard himself, who governeth his towns of conquest with a milder hand than we do our friends and allies. The causes thereof we find to be

two. The one is for lack of pay, without which It is impossible to preserve discipline among the soldiers, and most of the troops in her Majesty's pay (excepting the garrisons of Brill and Flushing) have not been paid from the beginning of September last, being now five months. The other is the lack of government in the captains and officers who for the most part are either such as never served before, and have no judgement—no not to rule themselves, and such as make their profit of the poor soldiers so extremely as they are hateful to the companies, wherein if there is no redress, it were her Majesty did revoke all; for as the case of the common soldier now standeth the States receive little or no service of them but spoil and ruin of their towns and countries.^{9.93}

Wilkes wrote again to the Queen on 16 February 1587:

The weakness and confusion to which her troops are reduced for want of pay, having received nothing from 1 September to that day (16 Feb.). The captains of the horsemen are all in England, and thereby most of the companies evil led and governed, committing daily upon the villages and people extreme spoils, insolences, and mischiefs, which, together with the examples of the late treasons of Stanley and York (in Deventer), hath drawn our nation into the hated of this people very deeply, so as they are for the most part turned out of the towns, and refused to be taken into the garrison. The horsemen, destitute of money and food, are, without order, entered now into Holland (an unfit place for their abode), where the people have risen against them, and they to the number of 500 or 600, in terms either of themselves to do mischief, or themselves to be cut to pieces by the country—a case very lamentable for us that feel the grief of so hard a choice, can find almost no way to prevent the peril. I have urged the States by earnest letters (myself being at this present sick, by God's visitation, to the danger of my life) to take some order to relieve your people in this distress, myself offering my carcase (sic) in pawn, to answer in so much as they shall eat, after a certain rate. I find them reasonably inclined, yet affected by two impediments—a strange jealousy, by them conceived of our nation; the other their own

want The confusions are wonderful that are grown in this State in the absence of my Lord of Leicester, which has opened many gaps to disorders' ^{9.94}

One further report by Wilkes on the 12th March 1587 regarding the state of the troops was also sent to the Queen as well as to Leicester:

I saw no remedy for them but to engage myself for some means to feed them Until other order might be taken, whereupon with the help of mine own Credit, and pawn my own carcase (sic) to repay at the end of two months £800, which I divided among the companies distressed, being eight in number, which extended to thirty shillings a man etc. ^{9.95}

The army of Elizabeth was a rabble in early 1587, virtually leaderless, starving through the winter, violent towards the civil population, looting and raping. The Dutch were locking up their towns against their erstwhile colleagues. English horsemen up to six hundred in number apparently had been able to feed their animals but Wilkes suggests that the English were running riot. The question must be asked what was the response of the Queen and the Privy Council to the reports of Wilkes? Fresh troops were moved by Leicester into the Netherlands in September 1587 and occupied several towns. ^{9.96} Some money was flowing to the starving garrisons by 17 February 1587 at last when the sum of £600 was sent to the captains 'to be by them distributed to the soldiers....by way of relief to help them...from any such extremity as may force their soldiers to enter any mutiny or other disorder' ^{9.97} The troops were possibly receiving food and lodgings from the Leyden area where support for England's efforts were greatly appreciated particularly by the 10,000 refugees from Brabant and Flanders.

By mid-summer the troops were also receiving corn from the eastern English counties. ^{9.98} The Dutch towns were experiencing great problems themselves due to famine, as the Netherland's harvests failed in 1587-1589, causing the most serious famine of the century. Between 1562-1569, 23% of the grain for the population in the Netherlands was imported from the

Baltic.^{9.99} The Danish-Polish wars of 1563-1570 had caused the volume of shipping entering the Baltic Sea from the Dutch ports to drop from 1,294 ships in 1568 to 516 in 1569. The Dutch shipping remained below normal thereafter as the ships were diverted to north German ports. Importing Baltic grain was not easy because of the interior Spanish blockades of canals and waterways and the hazards of Spanish presence in the northern provinces of the Netherlands. The Dutch traders had re-established much of their dominance in the Baltic with time and had control of 83% of Danzig's exports by 1583 but the volumes of grain and delivery problems remained.^{9.100}

But what of the medical practitioners? Had they too deserted and returned to England? There is no doubt that William Clowes had returned to England probably at the same time as the Earl of Leicester who was in bad health and needing medical assistance. Clowes subsequently served in the navy against the Spanish Armada. As the principal medical officer in the English Flanders army, his example by leaving may have been followed by Barber-Surgeons, apothecaries and those levied untrained medical 'practitioners' who had better practices and comfort at home.

Sir Roger Williams in 1585 complained that the troops were so scattered that it was impossible to detect all disorders that may have involved the English soldiers.^{9.102} Queen Elizabeth received Wilkes' report in March outlining the dreadful state of the army but nevertheless in April 1587 she ordered that her forces, diplomats and representatives should support the province of Holland in any power struggle among the Provinces in the States-General.^{9.101} as Holland was the 'moste mightie and riche of all, the provinces' and the body to which 'rest doe always incline'.

Yet perhaps not all of the troops were in the same plight and there was a recognizable force outside the garrisons. In August 1588, the English garrisons were scattered into small bands of varying strength. The groups appear to have some military value as they were now under the overall command of Sir Francis Vere, the army general in the field. His reputation makes it likely that he provided medical assistance. Their morale had

improved and sufficient discipline returned for a successful defence of Bergen-op-Zoom in October 1588 but the figures show that there were scarcely one thousand English troops in the garrison.^{9.103} The remainder of the force was mainly German and Scots but rarely Dutch.^{9.104} A year later, October 1589, a force under Vere routed a mixed Spanish/Italian force of three thousand men, all this success suggesting better morale and probably better rations coupled with the knowledge of the failure of the great Spanish Armada had led to an efficient fighting force.^{9.105}

Further morale building for the troops was to follow in early 1590 when Prince Maurice captured Breda in a manner that could be romanticized to gain even more. Eighty men hidden in peat barges were smuggled into the city; overwhelmed the gate guards, and allowed the entry of the seventeen hundred men waiting outside to enter. Six hundred of these men were Vere's Englishmen. By May 1591, Maurice and Vere had ten thousand infantry and eighteen hundred cavalry in a highly disciplined army. English troops continued to serve with the Dutch until 1609^{9.106} Medical practitioners were again needed but Dutch sources may well have provided the bulk of these.^{9.107}

The English military force in August 1588 was quite small and certainly many less than the nominal strength.

	<u>Nominal strength</u>	<u>Actual strength</u>
Flushing	2,100	1,445
Ostend	1,650	1,245
Bergen-op-Zoom	1,750	1,068
Brill	950	852
Wageningen	900	606
Utrecht	350	315
Amersfoort	77	52
Bergh	<u>90</u>	<u>77</u>
Totals	<u>7867</u>	<u>5660</u> ^{9.108}

The difference being 2207 or 28% of the nominal force. Theoretically there should have been at least fifty-six medical practitioners to reach the previously agreed ratio. The main bodies of English troops were then in the Province of Zeeland and at Ostend in Flanders.

This was the state when Leicester who left during the winter in December 1587. The troops were 'ill lodged, ill paid, often hungry and as disgruntled as after his departure as before'.^{9.109} 'They and liable to change sides or even to deal with the Spanish and to surrender.'^{9.110} The discontent of the English was known to be obvious in four major towns in the Netherlands and indeed broke out as a major mutiny in 1589; the English Garrison at St. Geertruidenberg surrendered to the Spanish.^{9.111} The causes of the upsets were bad food and bad pay as they had been on Leicester's departure.

There can be very little offered in defence of Leicester for the dire straits in which the English army was asked to serve. Certainly money in large amounts was given to him early in the campaign. It is said that he lived extravagantly and that his court in the Netherlands was acting as though he was the monarch of the Netherlands. If this was the impression which was conveyed to Elizabeth and certainly the reports of Wilkes could have left no doubt of the depths to which the troops had fallen, recall of Leicester should have been mandatory but not at the same time to leave her army stranded. What a terrible indictment of the English military machine is entailed in the words of Wilkes: 'we begin to grow as hateful to the people as the Spaniard himself, who governeth his towns of conquest with a milder hand than we do our friends and allies.' (Author's emphasis)

The fact that Elizabeth sent Wilkes specifically to monitor the situation under Leicester's governorship shows that she had doubts about his self-promotion. Did she indirectly punish him by ignoring the plight of the troops under his command and thus undermining his reputation in England?

To the medical practitioners, illness was part of their way of life and it was their roll to give assistance in a manner that they thought appropriate. The

gathering of malnourished, vitamin deficient, poorly clad, dispirited and fearful men housed in poor accommodation would encourage the outbreaks of epidemic and endemic disease such as typhus, food poisoning and the ever present venereal disease. These illnesses would not be new to the practitioners. However the conditions in Flanders were extreme and could lead to desperate measures being taken by the troops including desertion and mutiny. The stress could be such that depression and fear would have commonplace and may well have unmasked dementia as well as the violence of schizophrenia.

REFERENCES

- ^{9.1} Guy, John. *Tudor England*, (Oxford University Press, Oxford 1988), p.347
- ^{9.2} Lewis, Michael 'The Spanish Armada', (B.T.Batsford Ltd, London, 1960), p.176
- ^{9.3} Williamson, James A. 'Hawkins of Plymouth' (Adam and Charles Black, London),p.280
- ^{9.4} Ibid. p. 294
- ^{9.5} Laffin, John. 'Surgeons in The Field' (J.M.Dent and Sons, London, 1970). p. 35
- ^{9.6} Lewis, Michael, 'The Spanish Armada', (B.T.Batsford Ltd. London, 1960), p.179
- ^{9.7} Keevil, J.J.'Medicine in the Navy', (Livingston, London, 1957) Vol 1. quoted by Lewis, Michael 'The Spanish Armada', (B.T.Batsford Ltd, London, 1960, p.179
- ^{9.8} Lewis, Michael, 'The Spanish Armada', (B.T.Batsford Ltd. London, 1960), p.181
- ^{9.9} Slack, P. 'Mortality Crises and Epidemics, 1485-1610'. *Health, Medicine and Mortality in the Sixteenth Century*, (Cambridge University Press, Cambridge, 1979). p. 22
- ^{9.10} Harrison: *Principals of Internal Medicine*, (McGraw-Hill Book Company, New York) 9th Ed. pps.754-756.
- ^{9.11} Garrison, Fielding, H. *An Introduction to the History of Medicine*, (W.B.Saunders, Philadelphia, 1929).4th Edition, p.242
- ^{9.12} Ibid. p. 238
- ^{9.13} Reed, C. S. 'The Codpiece: Social Fashion or Medical Need?' *Internal Medical Journal*, (Blackwell Publishing, Melbourne, 2004). 34:684-686.
- ^{9.14} Heizmann, Charles L. 'Military Sanitation in the Sixteenth, Seventeenth and Eighteenth Centuries.' *Annals of Medical History*, (Paul Hoeber, New York, 1917). Fall issue 1:281.
- ^{9.15} Garrison, Fielding, H. *An Introduction to the History of Medicine* (W.B.Saunders, Philadelphia, 1929) 4th Edition. p. 67
- ^{9.16} Heizmann, Charles L. 'Military Sanitation in the Sixteenth, Seventeenth and Eighteenth Centuries.' *Annals of Medical History*, (Paul Hoeber, New York, Fall issue, 1917). 1:287.
- ^{9.17} Ibid.p.284
- ^{9.18} Garrison, Fielding, H. *An Introduction to the History of Medicine* (W.B.Saunders, Philadelphia, 1929) 4th Edition. P.67
- ^{9.19} Heizmann, Charles L. 'Military Sanitation in the Sixteenth, Seventeenth and Eighteenth Centuries', *Annals of Medical History*, (Paul Hoeber, New York, 1917). Fall issue, 1:284
- ^{9.20} Ibid. p. 285.
- ^{9.21} Ibid. p. 286
- ^{9.22} Garrison, Fielding, H. *An Introduction to the History of Medicine*, (W.B.Saunders, Philadelphia, 4th Edition, 1929). p. 287
- ^{9.23} Schoen, Erhard. 'The Siege of Münster'. *Hollstein's German Engravings, Etchings, and Woodcuts, 1400 – 1700*, (Sound and Vision Publications, Rotterdam,

2000) 47:58.

- 9.24 Forbes, Thomas. 'The Changing Face of Death in London.' *Health, Medicine and Mortality in the Sixteenth Century*, (Cambridge University Press, Cambridge, 1979). p. 134
- 9.25 Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p. 146
- 9.26 Parker, Geoffrey. *The Dutch Revolt*, (Penguin Books, London, 1977), p.145.
- 9.27 Israel, J. *The Dutch Republic*, (Clarendon Press, Oxford, 1998), p.902
- 9.28 Harrison: *Principals of Internal Medicine*, (McGraw-Hill Book Company, New York) 9th Ed. pps.754-756.
- 9.29 Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p. 146
- 9.30 Giono, J. 'The Battle of Pavia, 1525', Peter Owen, London, 1965, (translated from the French).
- 9.31 Goodman, D. 'Power and Penury', *Spanish Studies*, (Cambridge University Press. Cambridge, 1988) p.215
- 9.32 Ackroyd, Peter. *London*, (Chatto & Windus, London), 2000, p.336
- 9.33 Goodman, D. 'Power and Penury', *Spanish Studies*, (Cambridge University Press. Cambridge, 1988) p.214
- 9.34 *History Today, Companion to British History*, (Collins & Brown, London), 1995, p.376
- 9.35 Gabriel, R.A and Metz, K.S. *A History of Military Medicine*, (Greenwood Press, New York. 1992), 1: 20
- 9.36 Wilson, Derek. *Sweet Robin*, (Hamish Hamilton, London) 1981, p.31
- 9.37 Schoen, Erhard. 'The Siege of Münster' *Hollstein's German Engravings, Etchings, and Woodcuts, 1400 – 1700*, (Sound and Vision Publications, Rotterdam, 2000), 47:58.
- 9.39 Guy, John. *Tudor England*, (Oxford University Press, Oxford, 1988), p.287
- 9.40 Motley, J.L. *The United Netherlands*, (John Murray, London, 1869), p. 393
- 9.41 Guy, John. *Tudor England*, (Oxford University Press, Oxford, 1988), p.218
- 9.42 Motley, J.L. *The United Netherlands*, (John Murray, London, 1869), p. 393 quoting data S.P. Office Ms.p. 392
- 9.43 Ibid. p. 392
- 9.44 Harrison: *Principals of Internal Medicine*, (McGraw-Hill Book Company, New York) 9th Ed. p.1896
- 9.45 Allderidge, P. 'Management and mismanagement at Bedlam', *Health, Medicine and Mortality in the Sixteenth Century*, (Cambridge University Press, Cambridge, 1979), p.150
- 9.46 Harrison: *Principals of Internal Medicine*, (McGraw-Hill Book Company, New York) 9th Ed. p.424
- 9.47 Guy, John. *Tudor England*, (Oxford University Press, Oxford, 1988), p.214
- 9.48 Ibid.p.214
- 9.49 Hale, John, *The Art of War and Renaissance England*, (Folger Shakespeare Library, U.S.A, 1961). p. 2.
- 9.50 Motley, J.L. *The United Netherlands*, (John Murray, London, 1869), p. 183
- 9.51 *Calendar of State Papers* (Foreign Series, Elizabeth). Public Records Office, Ed. S.C.Lomas, 1921, Introduction
- 9.52 Jenkins, E. *Elizabeth and Leicester*, (Victor Gollance Ltd. London, 1961). p.199
- 9.53 B.Schmidt, *The Dutch Imagination and the New World, 1750-1670*, (Cambridge University Press, Cambridge, 2001) p.84
- 9.54 Ibid.p.85
- 9.55 Schot, John. *A True Relation*. Translation, Sir James William, 1587, ed. Samuel Scott, (John Johnson, Oxford University Press, Oxford. 1929).
- 9.56 Ibid.p.9
- 9.57 Jenkins, E. *Elizabeth and Leicester*, (Victor Gollance Ltd. London, 1961). p.320
- 9.58 Ibid.p.321
- 9.59 *Acts of The Privy Council of England, New Series, Preface*, (H.M.Stationary Office, Pub., London, 1897), p.6
- 9.60 Jenkins, E. *Elizabeth and Leicester*, (Victor Gollance Ltd. London, 1961). p.323
- 9.61 Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p.120
- 9.62 Ibid.p.120.
- 9.63 Schoen, Erhard. 'Massive Cannons', *Hollstein's German Engravings, Etchings, and*

Woodcuts, 1400 – 1700, (Sound and Vision Publications, Rotterdam, 2000),47:224

- 9.64 Guy, John. *Tudor England*, (Oxford University Press, Oxford, 1988), p.219
- 9.65 Jenkins, E. *Elizabeth and Leicester*, (Victor Gollance Ltd. London, 1961). p.329
- 9.66 Motley, J.L. *The United Netherlands*, (John Murray, London, 1869), p.155
- 9.67 Barthrop, M. *The Armies of Britain*, (National Army Museum Press, London, 1980), p.17
- 9.68 *Acts of The Privy Council of England, New Series*, (H.M.Stationary Office, London, 1897), 14:26
- 9.69 *Ibid.* 14:75.
- 9.70 Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p. 35
- 9.71 Barthrop, M. *The Armies of Britain*, (National Army Museum Press, London. 1980). p.17
- 9.72 Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946).p.127
- 9.73 *Ibid.*p.123
- 9.74 *Ibid.* p.125
- 9.75 Barthrop, M. *The Armies of Britain*, (National Army Museum Press, London, 1980). p. 15
- 9.76 Jenkins, E. *Elizabeth and Leicester*, (Victor Gollance Ltd. London, 1961). p.321
- 9.77 Motley, J. L. *The United Netherlands*, (John Murray, London, 1869), p. 183
- 9.78 Barthrop, M. *The Armies of Britain*, (National Army Museum Press, London, 1980). p. 15
- 9.79 Jenkins, E. *Elizabeth and Leicester*, (Victor Gollance Ltd. London, 1961). p. 319
- 9.80 Israel, J. *The Dutch Republic* (Clarendon Press, Oxford, 1998), p.222
- 9.81 Jenkins, E. *Elizabeth and Leicester*, (Victor Gollance Ltd. London, 1961). p.318
- 9.82 Motley, J.L. 'The United Netherlands' (John Murray, London, 1869), p.185
- 9.83 Israel, J. I. *The Dutch Republic*. (Oxford University Press, Oxford, 1998). p. 229
- 9.84 Garrison, Fielding, H. *An Introduction to the History of Medicine*, (W.B.Saunders, Philadelphia, 1929). 4th Edition, p.226
- 9.85 Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946), p.85
- 9.86 Motley, J. L. *The United Netherlands*, (John Murray, London, 1869), p.74
- 9.87 Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946), p.93
- 9.88 Israel, J. I. *The Dutch Republic*, (Clarendon Press, Oxford, 1998), p.237
- 9.89 Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p 109
- 9.90 *Ibid.* p.93
- 9.91 *Calender of State Papers, Foreign Series, Elizabeth*, 1589, (Public Records Office, Ed. S.C.Lomas, 1927, London), p.77
- 9.92 Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946), p.94
- 9.93 Motley, J. L. *The United Netherlands*, (John Murray, London, 1869), p.184
- 9.94 *Ibid.* p.184
- 9.95 Wilkes' reports from Motley, J.L. *The United Netherlands*, (John Murray, London, 1869), p.184 quoting from S.P.office MS.
- 9.96 Israel, J. I. *The Dutch Republic*. (Oxford University Press, Oxford, 1998). p. 231
- 9.97 *Acts of Privy Council, preface, New Series*, (H.M.Stationary Office, London, 1897), p.18
- 9.98 *Ibid*
- 9.99 Elliott, J.H. *Europe Divided, 1559-1598* (Collins, The Fontana Press.London,1968). p. 48
- 9.100 Vries, J. de and Woude *The First Modern Economy*, (Cambridge University Press, Cambridge, 1997).p.366.
- 9.101 Israel, J. I. *The Dutch Republic*. (Oxford University Press, Oxford, 1998). p.238
- 9.102 Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p.111
- 9.103 Garrison, Fielding, H. *An Introduction to the History of Medicine*, (W.B.Saunders, Philadelphia, 1929). 4th Edition, p.202
- 9.104 Israel, J. I. *The Dutch Republic*. (Oxford University Press, Oxford, 1998).p. 266
- 9.105 Elliott, J.H. *Europe Divided, 1559-1598* (Collins, The Fontana Press. London, 1968). p. 48
- 9.106 Barthrop, M. *The Armies of Britain*, (National Army Museum Press, London,1980). p. 17
- 9.107 Guy, John. *Tudor England*, (Oxford University Press, Oxford, 1988), p.346
- 9.108 Israel, J. I. *The Dutch Republic*. (Oxford University Press, Oxford, 1998). p.238
- 9.109 *Ibid* p234
- 9.110 *Ibid* p.233
- 9.111 *Ibid* p.233

CHAPTER 10

HOSPITALS, REHABILITATION AND PENSIONS

Giovanni Botero of Venice observed 'men usually avoid the dangers of war not so much for fear of death but for fear of disablement and the misfortunes which are brought about by wounds and other accidents.' He also said ' If the ruler is able to assure his soldiers that not only will they be well treated if misfortune befalls them, but that their wives, sons, sisters, or other relatives will be remembered if they are killed, then he will have less fear'.^{15.1} It had been the practice to slaughter the wounded, in particular, the mercenaries were answerable only to their employers and were under no obligation to render aid to the wounded.^{15.2}

Robert Dudley was praised for his 'compassion on the distressed' for giving succor to the 'poor friendless suitors' and giving 'considerable alms to the poor'. He paid for the education of two scholars at University College at Oxford.^{15.3} He founded in 1572, the Hospital of Robert, Earl of Leicester in Warwick. (later called Lord Leycester Hospital) intended initially as a public charity but changed in 1585 to men 'especially such as should be hereafter wounded maimed or hurt in the wars, in the service of her Majesty, her heirs and successors'. It may be seen as a very cynical change, as the initial men in Flushing were raised in his own estates. The hospital was to provide food and shelter for twelve poor brethren who were in charge of a master.^{15.4}

Queen Mary Tudor had made a provision in her will in 1558 for a house to be set up for infirm soldiers 'for the relief and help of poor, impotent and aged soldiers' in London but her request was ignored. It may be asked to what extent Philip had influenced her to include this item, as outlined previously, he may have considerable input into these social issues because of his personal involvement in similar matters in Spain^{15.5} It was not until the Elizabeth's Irish campaigns that some order appeared in regard to hospital services^{15.6}

Isabella of Spain had put the concept of a field hospital into practice in 1437 at the siege of Malaga when they were known as 'ambulancias'. Both Maximilian the First and Charles the Fifth, her grandson, had followed to some degree the idea of treating the wounded. The sick and wounded were sent to the baggage train where they were to be treated in tents, by physicians and barber-surgeons, and nursed by women who made up part of the 'followers' of an army. The menial tasks were given to other women and children. The less sick and wounded were then to be transported by wagons if the camp were to be shifted. If there were more seriously wounded and dangerously sick, they were to be transported to the nearest large town.^{15.7} Certainly in theory this could give the troops some peace of mind. How well this ideal could be followed in practice must be open to question. Leicester had a reference in his Army codes regarding nurses but none regarding hospital services in the field.^{15.8} (figure 25).

Some captains did recognize the need for hospitals. One captain suggested that churches and abbeys be converted to hospitals. He made the point that men who survived their first attack of dysentery were afterwards worth three recruits and for this reason alone the establishment of hospitals would pay a good dividend. It is interesting that the senior medical practitioners, in particular William Clowes and other trained Barber-Surgeons, did not make the suggestion that hospitals were highly desirable near the fields of battle. Of all the medical practitioners who served in the Netherlands, they should have been aware of the progress made by the Duke of Guise in the humane treatment of the wounded and ill. They would be aware that the campaign at St. Quentin had ignited changes in the English army medical forces and possibly the treatment of wounded. The lessons learnt elsewhere did not appear to have any great influence until Elizabeth's Irish campaign when the provision of military hospitals commenced.^{15.9}

Civilian hospitals in London were few in numbers at the end of Elizabeth's reign. St. Bartholomew's Hospital and St. Thomas Hospital were the largest. St. Thomas was a military hospital at the Savoy built in 1505 on the orders of

default in the Souldier, aswell the Captaine as his inferiour officers, to be punished with like penaltie.

4. And seeing it well besee meth all Christians, especially such as professe the militarie seruice, to passe away the time in matters requisite for their profession: And because no time can be more vainely spent, then that which is consumed in unlawfull games, besides the breeding of much contention, and quarrelles: And for that there be many allowable and commendable exercises for all sortes of men to use: Therefore it is streightly commanded, that no priuate Souldiour or inferiour Officer shall frequent the playing at Dice and Cardes, nor any other unlawfull games, upon pain of two dayes imprisonment for the first time, and for after committing the like, to be further punished by the Judges discretion.

5. And for that it often happeneth, that by permitting of many vagrant idle women in an armie, sundry disorders and horrible abuses are committed: Therefore it is ordeined that no man shall carrie into the felde, or deteine with him in the place of his garrison, any woman whatsoever, other than such as be knowen to be his lawful wife, or such other women to tende the sicke and to serue for launders, as shall be thought meete by the Marshall, upon paine of whipping and banishment.

6. And insomuch as clemencie amongst men of warre in some respects is a singuler vertue: It is ordeined that no man in any part of this seruice that he shall doe, shal lay violent handes upon any woman with childe, or lying in childebed, olde persons, widowes, yong virgins, or babes, without especial order from the Magistrate, upon pain of death.

7. What person soeuer that shall be commonly giuen to drunkenesse or riotously behaue himselfe, shall be banished the Armie.

8. Whosoever shall conceale, or in any sort keepe secrete Treason, any dangerous Conspiracie, or other practice which may be hurtfull, and may concerne the perill of her Maiesties person, or of her General, or the estate of the Armie, and shall not with all diligence reueale the same either unto the Generall, or some other Officer of especiall trust, shall incurre the paines of death with torments.

9. No man shall haue speeche or conference, send message, deliuer or receiue letters to or from the enemy, or any of his confederates, either secretly or openly, without manifesting the same presently unto the Generall or Marshall, or having former authoritie so to doe upon paine of death.

10. No man being in this seruice shal depart ye Campe or place of Garrison for any cause whatsoever, without the Generals especial Pasport, or other head Officer authorized, upon pain of death.

11. No man shall breake out or leaue the order of his ranke,

* Figure 25 Extract from Leicester's disciplinary code, from Cruickshank, p.146

Henry the Seventh and based in design on the Santa Maria Nuova in Florence.^{15.10}

The hospital for the mentally disturbed at St. Mary of Bethlehem existed in London and also a few surviving lazar houses.^{15.11} Nurses were employed at St. Bartholomew's Hospital for the treatment of skin diseases, but their services elsewhere seem not to have been recorded. In Norfolk, their equivalent was noted for house calls.

Sir J. W. Fortescue when the question of relief for disabled soldiers was raised dismissed the matter by saying:

Elizabeth was not friendly to soldiers, and hated to be troubled with obligations towards men who had faithfully served her. An Act had been passed in 1593, throwing the relief of crippled or destitute soldiers on their parishes, and she could not see what more they could want. Bloody Mary had shown them compassion: not so would Good Queen Bess; she would not be pestered with the sight of the 'miserable creatures'.^{15.12}

Cruickshank believes that this criticism is not justified.^{15.13} There were a few examples of sinecure positions being set up and some widow's pensions granted by Queen Elizabeth. Most of the soldiers were covered to some degree by the provisions of the Pensions Act, passed in 1593, to provide a weekly levy from every parish to give compensation for injuries sustained on active service. The pensions were to be paid from a designated scale ranging from one penny to a maximum of six pence. The Justices of Peace had overall responsibility but the distribution was in the hands of the 'overseer of the poor'.^{15.14} The money raised was insufficient and a further tax was authorized to allow for a levy of between two and eight pence weekly from the parishes. The amount was far from adequate for each pensioner and needed readjustment in 1597 with an even higher tax was needed to care for those soldiers who had been recruited from London. This system had great faults due to its inadequacies but it was a start towards a more liberal social scale.

Perhaps it could be expected that this parochial system would ensure that distribution of funds would be more equitable. However the county treasurers attempted to cheat whenever possible and decreed in that one particular county, Norfolk, that if a man was a volunteer, he was not eligible for relief. This ruling was soon overturned.^{15.15} It is likely that the medical practitioners would be employed by the civil authorities to separate the needy from the rogues.

An official was sent to France in 1591 to look at the plight of the sick English soldiers and to repatriate men with illnesses or disabilities who could not be reasonably expected to recover sufficiently for further service. In 1594, a process of sick leave was commenced and the pay of the soldier was maintained.^{15.16} Also it was possible by 1594 for a sick soldier to be able to return to England for treatment. He was retained on the muster roll. He was paid only if on his return to the force within three months. During his treatment period, he was required to provide a certificate from a hospital or from a justice or high constable that he was on medical leave. This was also needed for his pay on return to duty. This information was from Cruickshank who quotes the Cottonian manuscripts as his source. The quote raises many questions, Where were the hospitals? A certificate from a justice or high constable suggests that there were 'rural' hospitals able to offer aid to the sick soldier. Certainly in the Netherlands, 'guest houses' were employed, private houses with the owner responsible for the housing of the ill. It was not until 1598 that a specific military hospital for the wounded and sick was commenced outside Dublin. As previously noted a military hospital existed at the Savoy in London and another for disabled soldiers for permanent residence in Buckingham in 1599.

Fortescue's harsh criticism of Elizabeth's policy towards the sailors who had been involved in the English defence against the Armada shows that he was probably justified in his comments. The seamen demanded that payment and discharge should go together. There was no money. If the men stayed, the wage bill grew and they needed to be fed and there was no money to buy

food. Lord Howard, the Lord Admiral was humane and recognized how well the seamen had acquitted themselves and he refused to discharge them unfed and many starving. He paid many out of his own pocket and from 'treasure' previously collected by Sir Francis Drake. He appealed directly to the Queen for money, probably with no success. If this was the attitude to the victors how then were the soldiers less likely to be paid!

Only a few men who were levied ever returned to England from foreign expeditions.^{15.17} The government appears to have had a major problem in knowing how to deal with those who returned to England illegally who were mostly deserters. They joined the already large population of vagrants. In 1600, it was estimated that there were 12,000 beggars in London.^{15.18} Thomas Digges advocated that for those soldiers who had been legitimately discharged, they should be allowed to join their former trade and this concept was endorsed by a Royal Proclamation in 1589. If employers failed to offer work, they could be subject to severe penalties. In 1590, plans were made to make it easier for returning veterans to return to their homes. The port authorities were instructed to provide enough money to allow them to proceed home. A pass was issued to give time for the journey to be completed.

A problem arose when many men were found in London claiming to be veterans. In 1592, a commission was set up which assembled all men who alleged that they had served. Following interrogation, an evaluation of their wounds was made to establish their suitability for work. Those disabled were directed to hospitals. Able-bodied men were given authentic discharge papers and all others were jailed. By 1596, the problem had become so extreme that curfews were needed at night to clear the streets of vagrants. A second commission was undertaken to evaluate each man's claims. There appears to have been no specific services existing for the ill and the disabled who were thrust upon the goodwill of the councils of cities, towns and villages.

REFERENCES

- ^{10.1} Hale, John, *The Art of War and Renaissance England*, (Folger Shakespeare Library, U.S.A, 1961). p. 121
- ^{10.2} Garrison, Fielding, H. *An Introduction to the History of Medicine*, (W.B.Saunders, Philadelphia, 1929). 4th. Edition, p.61
- ^{10.3} Wilson, Derek. *Sweet Robin*, (Hamish Hamilton, London 1981), p.145
- ^{10.4} Jenkins, E. *Elizabeth and Leicester*, (Victor Gollance Ltd., London, 1961). p.309
- ^{10.5} Heizmann, Charles L. 'Military Sanitation in the Sixteenth, Seventeenth and Eighteenth Centuries', *Annals of Medical History*, (Paul Hoeber, New York, 1917). Fall issue, 1:288.
- ^{10.6} Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p.125
- ^{10.7} Heizmann, Charles L. 'Military Sanitation in the Sixteenth, Seventeenth and Eighteenth Centuries', *Annals of Medical History*, (Paul Hoeber, New York, 1917). Fall issue 1: 281
- ^{10.8} Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946). p.146
- ^{10.9} *Ibid.* p.125
- ^{10.10} *Ibid.* p.126
- ^{10.11} McVaugh, M.R. 'Medicine in the Middle Ages' in *Western Medicine: An Illustrated History*, (Oxford University Press, Oxford, 1997), p.69
- ^{10.12} Pelling, M. and Webster, C. 'Medical Practitioners', *Health, Medicine and Mortality in the Sixteenth Century*, (Cambridge University Press, Cambridge, 1979), p.180
- ^{10.13} Fortescue, J. W. *History of the British Army*, (MacMillan, London, 1906) 1:128
- ^{10.14} Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946), p.128
- ^{10.15} History Today, *Companion to British History*, (Collins & Brown, London, 1995), p.608
- ^{10.16} Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946), p.124
- ^{10.17} *Ibid.* p.123 re Cottonian reference, Galba D, IX, f. 31ob.
- ^{10.18} *Ibid.* p.124
- ^{10.19} Ackroyd, Peter. *London*. (Chatto & Windus, London, 2000), p.608

CONCLUSION

The campaign carried out by the forces of Elizabeth the First in Flanders was an exercise in dealing with the problems of warfare in which the forces of the combatants were fragmented throughout the country in a terrain, which was subject to extremes of weather. The soldiers during most of the campaign were poorly led, poorly trained, neglected for food and for pay. They had low morale, lived in poor accommodation and for many months were without adequate clothing and often near starvation. They were after 1588 and the Armada, a forgotten army.

Sir John Fortescue summed up the campaign correctly by saying 'There have been sovereigns and many ministers who have betrayed their soldiers but none so wantonly, willfully and scandalously than Elizabeth'.^{co1}

The medical attention was scant and fragmented; the medical practitioners were ill equipped by training or knowledge to attend to the damage caused to the body by projectiles. Extensive burns caused by gunpowder needed new approaches that for the most part appear not have been implemented. It is not clear whether the English were altering their approach to the compound fractures and cavity wounds caused by the bullets of the firearms. It is also not clear if those few medical practitioners who may have known of the advances in Continental military medicine were applying this knowledge or taught their colleagues about the changes.

Medical textbooks in the vernacular were scarce prior to 1600. Even so the English medical practitioners in civilian and army life failed to recognize that the way was open for the implementation of scientific method by clinical observation of potent agents for the relief of human suffering. The correct use of mercury compounds alone would have given vast benefits to the population. The knowledge that pain relief was in medical hands by application of anaesthesia and the opium compounds was not exploited in the army.

However knowledge of medical matters, in particular the Paracelsian revolution in therapy and the practical wisdom of Paré, was being disseminated, probably by word of mouth from travelers, refugees and the practitioners who ventured to learn on the Continent. The early lessons learned about repatriation of the wounded and sick and the subsequent provision of pensions were to be of greater value by extension in English campaigns after the Flanders campaign.^{Co.2} If the English army improved medical services at all, then these were as a result of 'piggy backing' on the experiences from the Continent.

What did the reformation times bring to military medicine? The recognition by skilled military commanders that the need for organized medical assistance had become a necessary part of the Army. The climate of better treatment of wounded and prisoners became part of the military expectations. Military medical practitioners were pressing for improved standards and surgical skills both in the Army and Navy. The foundations for the implementation of these ideas in the English armed forces had been laid during this campaign.

So, changes did occur slowly. The provision of a greater number of medical practitioners at St.Quentin was probably in recognition of the extraordinary value of hygiene at Metz and the disciplinary codes of Leicester show that somewhere within government or the army, basic camp needs were being recognized. Anatomy and dissection of the human body was underway, both medical practitioners and the general public were accepting experiments with mineral and herbal cures.

In overall terms, it would appear that changes to initiate new concepts in military medicine did occur but were the result of informal pressures. It is likely that the practical changes in the field were developed from the practices of the unlicensed medical practitioners and learnt in the bitter lessons of the sieges and battles as had been the case in Europe.

Co.1 J. W. Fortescue, *History of the British Army*, (MacMillan, London, 1906). 1:128

Co.2 Cruickshank, C.G. *Elizabeth's Army*, (Oxford University Press, London, 1946), P.126

REFERENCES

- Ackroyd, Peter. *London*, Chatto & Windus, London, 2000.
- Allderidge, P. 'Management and mismanagement at Bedlam', *Health, Medicine and Mortality in the Sixteenth Century*, Cambridge University Press, Cambridge, 1979.
- Appleby, A. B. 'Diet in Sixteenth Century England: Sources, Problems, Possibilities.' *Health, Medicine and Mortality in the Sixteenth Century*, Cambridge University Press, Cambridge, 1979.
- Barthrop, M. *The Armies of Britain*, National Army Museum Press, London, 1980.
- Beckett, I. F.W. *The Amateur Military Tradition, 1558-1945*, Manchester University Press, Manchester, 1991.
- Black, J. B., *The Reign of Elizabeth, 1558-1603*, Oxford University Press, Oxford, 1994.
- Brunschwig, Hieronymus. *The Book of Chirurgia*, Milan, R.Lier, 1923. Strassburg, 1497.
- Cavendish, R. 'The Treaty of Lyons', *History Today*, Vol.54, Issue 1, January, 2004.
- Clowes, W. *Prooved Practice for All Young Chirugians, Concerning Burnings With Gunpowder*, London, 1591.
- Copeman, W.S.C. *Doctors and Disease in Tudor Times*, Dawsons of Pall Mall, London, 1960.
- Cruikshank, C. G. *Elizabeth's Army*, Oxford University Press, London, 1946.
- Elliott, J.H. *Europe Divided, 1559-1598*, The Fontana Press, Collins, London, 1968.
- Forbes, Thomas. 'The Changing Face of Death in London.' *Health, Medicine and Mortality in the Sixteenth Century*, Cambridge University Press, Cambridge, 1979.
- Fortescue, J. W. *History of the British Army*, MacMillan, London, 1906.
- Gabriel, R.A and Metz, K.S. *A History of Military Medicine*, Greenwood Press, New York, 1992.
- Gaimster, David. 'German Stoneware, 1200-1600', British Museum Press, London, 1997.
- Gale, Thomas *Certain Works of Chirurgie*. Amsterdam, 1563.
- Garrison, Fielding, H. *An Introduction to the History of Medicine*, W.B.Saunders, Philadelphia, 1929. 4th Ed.
- Giono, J. 'The Battle of Pavia, 1525', Peter Owen, London, 1965, translated from the French.
- Goodman, D. *Power and Penury, Spanish Studies*, Cambridge University Press, Cambridge, 1988.
- Guy, John. *Tudor England*, Oxford University Press, Oxford, 1988,
- Hale, John, *The Art of War and Renaissance England*, Folger Shakespeare Library, U.S.A, 1961).
- Harrison, W. quoted by Appleby, A. B. 'Diet in Sixteenth Century England: Sources, Problems, Possibilities.' *Health, Medicine and Mortality in the Sixteenth Century*, Cambridge University Press, Cambridge, 1979.
- Harrison: *Principals of Internal Medicine*, (McGraw-Hill Book Company, New York) 9th Ed.
- Heizmann, Charles L. 'Military Sanitation in the Sixteenth, Seventieth and Eighteenth Centuries', *Annals of Medical History*, (Paul Hoeber, New York, 1917)

- Hexham, 'The Principles of the Art Military Practiced in the Wars of the United Netherlands' 1637
- Israel, J. *The Dutch Republic*, Clarendon Press, Oxford, 1998.
- Jenkins, E. *Elizabeth and Leicester*, Victor Gollance Ltd. London, 1961.
- Job, Gijsius. *Oorsrong en Vootgang der Neder-Lantsche Beroetend*, Leiden, 1616
- Keegan, J. *The Face of Battle*, Jonathon Cape, London. 1976
- Keevil, J.J. 'Medicine in the Navy', Livingston, London, 1957, Vol. 1.
- Laffin John. 'Surgeons in the Field', J.M.Dent & Sons, London, 1970.
- Lancereaux, E. *A Treatise on Syphilis*, The New Sydenham Society, London, 1888
- Lewis, Michael 'The Spanish Armada', B.T.Batsford Ltd, London, 1960.
- Longman's. *Illustrated Encyclopaedia of World History*, 1976, Peerage Books, Avon, England, 1985.
- Lyons, A.S. and Petrucelli, R. J. *Medicine- an Illustrated History*. Macmillan, Aust. 1979.
- McVaugh, M R. 'Medicine in the Middle Ages' in *Western Medicine: An Illustrated History*, Oxford University Press, Oxford, 1997.
- Merriman, Marcus, 'Realm & Castle', *History Today*. Vol.41. Issue 6. June 1991.
- Motley, J.L. *The United Netherlands*, John Murray, London, 1860.
- Paré, A. *The Works of Ambroise Paré [Paré]*, Cornhill, London. 1611.
- Parker, Geoffrey. *The Dutch Revolt*, Penguin Books, London, 1977.
- Parker, George. *The Early History of Surgery in Great Britain*, (A. & C. Black, London, 1920).
- Pelling, M. and Webster, C. 'Medical Practitioners', *Health, Medicine and Mortality in the Sixteenth Century*, Cambridge University Press, Cambridge, 1979.
- Reed, C. S. 'The Codpiece: Social Fashion or Medical Need?' *Internal Medical Journal*, Blackwell Publishing, Melbourne, 2004.
- Reed, Karen. *Botany in Medieval and Renaissance Universities*, Garland Publishing, London, 1991.
- Ring, M.E *Dentistry, An Illustrated History*, Abrams Publishers, St.Louis. 1985.
- Schoen, Erhard. 'The Field Surgeon' *Hollstein's German Engravings, Etchings, and Woodcuts, 1400 – 1700*, Sound and Vision Publications, Rotterdam, 2000.
- Schot, John. *A True Relation*. Translation, Sir James William, 1587, ed. Samuel Scott, John Johnson, Oxford University Press, 1929.
- Schmidt, Benjamin, *The Dutch Imagination and the New World, 1570-1670*, Cambridge University Press, Cambridge, 2001.
- Segerist, Henry, E. 'Ambroise Paré's Onion Treatment of Burns', *Bulletin of the History of Medicine*, 15:2:1944.
- Seward, Desmond. *The Monks of War*, Penguin Books, England.
- Singer, Charles, 'Medicine in the Reign of Elizabeth 1st', *The Medical Annual*, (John Wright, London, 1953).
- Slack, P. 'Mortality Crises and Epidemics, 1485-1610', *Health, Medicine and Mortality in the Sixteenth Century*, Cambridge University Press, Cambridge, 1979.
- Sutcliffe, Matthew, *The Practice, Proceedings and Lawes of Armes*, London, 1593

- Vries, J. de and Woude *The First Modern Economy*, Cambridge University Press, Cambridge, 1997.
- Young, S. *Annals of the Barber-Surgeons*, Blades, East & Blades, London, 1890.
- Watson, G. 'Theriac and Mithriadatum: A Study in Therapeutics', The Wellcome Historical Library, London, 1966.
- Wangensteen, O. *Bulletin of the History of Medicine*, 46:3:207-234, 1972.
- Williams, Sir Roger. *The Actions of the Low Countries*, London, 1618.
- Williamson, James A. 'Hawkins of Plymouth', Adam and Charles Black, London.
- Wilson, Derek. *Sweet Robin*, Hamish Hamilton, London 1981.