'A MAN O' PARTS':

A CASE STUDY OF AN ENLIGHTENED MAN, SIR GILBERT BLANE, BART.

by

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ABSTRACT

Europe in the eighteenth witnessed a period of enlightenment in which philosophers redefined man and his social relationships. In Scotland, the universities were the main vehicles of the enlightenment. Yet it was not simply an intellectual movement; social, cultural and political features of life and society were affected. The initial developments relating to man and society were in the sphere of moral philosophy but were increasingly translated into other fields. The natural sciences, and particularly the medical faculties of Scottish universities, were to make particular use of the empirical methods advocated. Of considerable importance was the medical faculty at Edinburgh University, an institution that became a world renowned center of learning.

The enlightenment in Scotland was not a parochial affair. The work of Adam Smith, Adam Ferguson, David Hume and many others was felt far abroad. The primary beneficiary was England and it received not just ideas but also a considerable influx of men fresh from the Scottish universities. The medical faculties were a prime source of new talent. Gilbert Blane was one such young doctor. He had received his schooling at Edinburgh at the height of the enlightenment in the 1770s. His diverse range of interests and passion for facts and figures characterized the 'enlightened' approach that was strongly evident in his subsequent career as a physician in England.

The great impact he had in the reform of medical practices and

standards in the Royal Navy was out of all proportion to the meager place accorded him in the historical annals of the Navy. His reforms were pushed slowly forward in a continuous battle but Blane made considerable headway in completing reforms for the treatment of scurvy and other sea diseases prevalent among the crew of the Navy - reforms not just in practical terms but also by improving the regulations of the Navy.

While his connection with the Navy continued through to the end of the Napoleonic Wars, Blane's interests also branched into civilian affairs. During the wars and in the post-war period of social and political ferment he kept abreast of the many reform issues and contributed his expertise whenever possible. Whether making recommendations in the Navy or the civilian spheres, Blane believed it important, first, to educate the people to whom he was appealing to of the need for reform and, second, to make his suggestions as attractive as possible for all parties concerned. In accordance with the philosophy of the enlightenment, Blane thought that the expansion of the mind through education was beneficial for a better understanding by man, of himself and his environment. His consistent employment of these methods proved him to be truly an enlightened man.

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PREFACE

The eighteenth century was a time of enlightenment for Europe, a period in which philosophers redefined man and his social relationships. Not simply an intellectual movement, the enlightenment was to touch most aspects of life and society. It did not develop uniformly over all Europe but instead, appeared to develop more vigorously in some areas such as Scotland, than in others. The enlightenment in Scotland developed primarily within the universities and as it progressed, these universities came to produce a greater number of 'enlightened' students than that country was capable of absorbing. This excess served as spores to carry the modes of thought developed within the Scottish enlightenment to other lands, England being one such recipient. The full effects of the Scottish enlightenment on these lands, and of concern here, on England are incalculable, but through the study of the careers of certain individuals it should be possible at least to trace aspects of the transition from Scottish enlightenment thought to practice in foreign countries.

The leaders of the Scottish enlightenment sprang from an unusual sector of society, coming from classes other than the gentry and nobility, and were men educated through Scotland's national education system. Taking a more active role in society after the Union of Parliaments in 1707, these men developed philosophies of man and society based on empirical methods which were to have a significant impact in the establishments of Scottish universities. The initial developments relating to man and society were in the sphere of moral philosophy but as

intellectuals in other disciplines became aware of these ideas, they strove to translate them into their own fields. The natural sciences, and particularly, the medical faculties of Scottish universities, were to make particular use of the empirical methods. Due to its location within that city important to Scotland's national and international life, Edinburgh University was more prominently affected by the philosophies of the enlightenment than were the other Scottish universities. It became a world renowned center of learning, especially its medical school, and in turn produced many of the individuals who were later to look outside of Scotland for career opportunities.

Sir Gilbert Blane was one such individual. Trained in the medical faculty of Edinburgh University at the height of the Scottish enlightenment he was a man with a diverse range of interests and a passion for facts and figures. While this was no doubt in part inherent in his nature, the education he received at Edinburgh and later through William Hunter, played a principal role in honing these empirical skills. The 'enlightened' approach was to be strongly evident in what he attempted and accomplished in his subsequent career as a physician.

Blane made his initial and greatest impact in the Royal Navy, the Navy being a particular recipient of the enlightenment overflow from Scotland's medical schools. While he has already been accorded a place in the historical annals of the Royal Navy, Blane deserves much more credit for the effort he put into reforming the medical practices of the Navy in the late eighteenth and early nineteenth centuries. Prior to his arrival medical opinion was divided on the treatment of sea diseases. James Lind, a

Scottish surgeon (and later, physician) of the pre-enlightenment era, had attempted reforms as early as the 1750s but had met with extremely limited success for a multitude of reasons. It was a slow process and a continuous battle but Blane made considerable headway in completing reforms for the treatment of the diseases prevalent among seamen not only in practical terms but also in the regulations of the Royal Navy.

One of the primary means Blane used in achieving his goals was to try to educate the people to whom he was appealing for reform. In accordance with the philosophy of the enlightenment, Blane thought that man's understanding of himself and his environment would be advanced by the expansion of his mind through education. He also thought that this would best serve the particular interests of the Navy. Another means employed by Blane was to make his suggestions as appealing as possible for all parties concerned, from the common seaman to the highest ranking members of the Admiralty. He ensured that his recommendations were reasonable, practical and financially feasible.

His Naval activities began in 1780, and continued until close to the time of his death in 1834. Apart from his efforts within the sphere of the Navy, however, his interests also branched into the civilian affairs of Great Britain. His high ranking position within the medical community and within the social circles of Britain, provided him with an excellent opportunity for reviewing numerous problems, some only remotely connected with the profession, through tracts, pamphlets and books. Once again, in making his recommendations and invoicing his concerns, his approach

encompassed those qualities of education and acceptability that he had first employed in his work for the Navy.

CHAPTER ONE

> Science, no doubt, promotes the arts of life; and it is natural for human wisdom to promote these arts. But, what are all the arts of life, or all the enjoyments of the animal nature, compared with the art of human happiness - an art which is only to be attained by education, and which is only brought to perfection by philosophy! Man must learn to know himself; he must see his station among created things; he must become a moral agent; and he must enquire after that system in which he had been intended either for happiness, or for misery, as an end. This is what he has to learn but it is only by studying things in general that he may arrive at this perfection of his nature. [1]

A major question concerning historians today is how and why Lowland Scotland could have been transformed from the "irredeemable poverty, social backwardness and political faction" of the late seventeenth century to the enlightened center of the eighteenth. Present day works reveal that historians generally agree with the view of R.G. Cant that the Scottish enlightenment was not due to a "freakish series of individual achievement owing nothing to the context in which they happened to occur". Instead, most historians would agree that the roots of the enlightenment must be found in Scotland's history - but on what aspects of its history and how far back it influenced the enlightenment remains a debated question.[2]

Although first and foremost a philosophical revolution, the Scottish enlightenment resulted in general social, cultural and economic change in the eighteenth century. In the words of Dugald Stewart, one of its leading exemplars, there was a "sudden burst of genius, which to the

foreigner must seem to have sprung up in this country by a sort of enchantment, soon after the rebellion of 1745".[3] Within Scotland as a whole, this activity flourished in a number of particular places and institutions. Derived from no single institution, social or political group, the literati who led the enlightenment were drawn from all levels of Scottish Society. They came from the conglomerate of students and ex-students of the universities and young professionals who were just beginning their careers. Included within this group were Francis Hutcheson, Adam Smith, David Hume, Adam Ferguson, Thomas Reid, Dugald Stewart, Lord Kames, and Lord Monboddo. "Closely connected by ties of friendship [except, perhaps, in the case of Kames and Monboddo] and the relation of teacher and pupil", they influenced one another, yet they were not "an ingrown, isolated group carrying on a type of pursuit peculiar to Scotland. On the contrary, they were closely in touch with the movement of thought on the continent". The link with the continent came through Scotsmen who had long travelled there to be educated as lawyers, doctors and ministers.[4]

During the fifty year period termed the enlightenment these moral philosophers attempted to establish the study of man and society on empirical foundations instead of received truths. They believed man could both understand and have some measure of control over his environment. The central interest of these 'enlightened' men was to explore man as a social and sociable being. They became concerned with human nature and human knowledge and the "problems relating to consciousness, personal identity and the foundations of knowledge". They believed in a "humane reasonableness", in "the uniformity of human nature and the universal

applicability of Good Sense". Their concern with social change and moral progress led to an increased awareness of the relationship of man to man, and of society to society. As well, they tried to discern the relationship between such institutions as marriage and family, education, law and government, religion, language and the society those institutions served.[5]

Along with these concerns, the philosophers insisted that it was essential to the development of any individual to have as wide a scope of knowledge as possible because all human capabilities were to be valued. This philosophy was reflected in the Scottish university curriculum. Unlike England, where early specialization was encouraged (e.g. at Oxford in classics and at Cambridge in mathematics) to provide a base for subsequent broader studies, in Scotland an initially broadly based philosophical education provided the foundation for increasing specialization in studies at a later date. This broadening was reflected in the moral philosophers, as in men of other academic fields, all of whom were encyclopedic in their knowledge. Indeed, "the highest tribute to an enlightened Scot was to be known as a 'man o' parts', meaning not only an extremely capable man in his field but also a man of wide-ranging interests and abilities". Thus, the primary aim and object of all education was, in the words of Stewart, "to cultivate <u>all</u> the various principles of our own nature, both speculative and active, in such a manner as to bring them to the greatest perfection of which they are susceptible".[6]

In conjunction with their desire to avoid narrowness of knowledge, the <u>literati</u> advised tempering one's drive for eminence to allow oneself

to strive for contentment and happiness, not only as an individual, but as a part of the larger sphere of society. In the words of Stewart once more, "It ought not be the leading object of anyone to become an eminent metaphysician, mathematician, or poet; but to render himself happy as an individual, and as an agreeable, respectable, and useful member of society".[7] The concept of being a part of society was considered important because, during the eighteenth century, "society ceased to be viewed as an artificial creation; instead it came to be called a natural relation". Society was defined by the literati as any group or collectivity; an individualistic interpretation was rejected. Hume wrote "Man, born in a family is compelled to maintain society from necessity, from natural inclination, and from habit". Along with Smith and Ferguson, Hume would have agreed with Reid, who wrote "I am very apt to think, that, if a man could be raised from infancy without any society of his fellow creatures, he would hardly ever shew any signs, either of moral judgement or of the powers of reasoning".[8]

In outlining their philosophy these men claimed as their mentors, Francis Bacon, John Locke, and Isaac Newton, rejecting metaphysical speculation in favour of the rigors of empirical study.[9] In establishing an empirical formula, ideas and methods utilized in natural philosophy were adapted to moral philosophy, creating an interaction between the two disciplines, in the belief "that mental and social phenomena should be subject to the same kind of scientific analysis as mathematics and physics". Eventually they hoped to establish moral laws to govern mankind just as general physical laws governed natural philosophy. In examining their attraction to science, it should

be remembered that in this century philosophy was spoken of instead of science and a procedure was approved by using the word 'philosophical' rather than the word 'scientific'.[10]

The basis for this convergence of moral and natural philosophy was to be useful knowledge, induced from empirical observation.[11]

> As they looked into their own minds and found there evidence of benevolence, fear, vanity, justice, love as well as ideas conveying information about the physical world; when they saw other people behaving as if they, too experienced these same inclinations, it seemed to them that they had discovered not only an observable basis for the science of man, but one so universal that it embraced all the laws of nature at work in and for man. Hence, the organizing principles for making a science of man became for them human nature. [12]

It was felt that from observing the nature of things, and in the case of the science of man, the nature of man and his achievements, general principles could be established whereby the particular was sunk into a generality, and "philosophy, or science, was in their conception made up of bodies of knowledge, each body comprehended within as few general principles as possible".[13] In their use of human nature as providing all knowledge and human phenomena they ignored 'Reason', for the day of "trusting to reason as an infallible weapon and as a motive force in human life had passed". Instead, they took as their "empirical base-line the sensations and sentiments, which seem to operate with more universality and more predictably than does reason".[14]

These moral philosophers held commanding places in an orderly academic system, and, because of this, and because of the character of the universities, gradually their ideas, often initially introduced to them from natural philosophy, "were sifted, refined and transformed" and

then reintroduced to their scientific colleagues. What resulted was that this latter group re-evaluated and analyzed "the foundations of their disciplines" and consequently brought about changes in the "nature of scientific method and in the character of the intellectual constructs which form the subject-matter of the natural sciences". Richard Olson noted the impact of this refluxing of ideas: "over and over again we find Scottish scientists writing works on the philosophical and psychological background of their subjects and including metaphysical and epistemological concerns even in their scientific monographs and textbooks".[15] Out of this combination of literati and intelligentsia and their studies arose a strong sense of social responsibility which equally affected both philosophers and scientists. While the philosophers were concerned about the social implications of their thinking, and were the first to be alive to the social reforms necessary in their day, the "scientists were anxious to employ their discoveries for the benefit of their fellow-man".[16]

The Scottish enlightenment did not encompass all of Scotland. Indeed, it was a Lowland phenomenon that tended further to widen the stark contrasts between Lowland and Highland Scotland. Geographically, the areas most involved were the "central lowland belt bounded by Glasgow in the west and Edinburgh in the east but taking in the city and universities of Aberdeen". Even within these areas, however, the enlightenment was an urban movement for only the cities housed the institutions and personages necessary to such a movement. Aberdeen, Glasgow and Edinburgh were to become the major centers of the Scottish enlightenment where the necessary institutions, primarily the universities,

were already in existence.[17]

The composition of the group heading the movement was not, perhaps, what one would expect to find in the foreground of a Scottish movement in this period. Up until this time Scottish society had been led and directed by, and revolved around the landed classes of nobility and gentry. While the landed classes were the local rulers of eighteenth century Scotland they were not, with the exceptions of Lord Kames and Lord Monboddo, to provide the inspiration for the enlightenment. The lack of original contribution on the part of the landed classes can be explained by noting their secure position in society. Despite the opportunities afforded by social position, political influence, education and leisure, they had little incentive to produce new ideas. T.C. Smout commented that "their relative failure ... cannot be explained in material terms like that of the manual workers". Instead, he attributed their inertia to feelings of security within their niche in society. "There was no need for its members to drive for social recognition in the same way as there was for a member of the middle classes, who had to live by his pen, his teachings or his inventive talents."[18]

The removal to London after 1707 of the greater nobility, once a part of a homogeneous Scottish oligarchy, left behind in the urban centers of Scotland a politically truncated lesser nobility and gentry. The political instability of this 'rump' oligarchy led it to cast around in the next few decades for some means of redefining its position. It was to the literati, "that rootless, heterogeneous and largely youthful population which every administrative and social capital attracts", that

they looked to provide a new raison d'etre. Their role was largely limited to the provision of a valuable source of financial and social security and stability to the literati who were to lead the enlightenment.[19]

Life in seventeenth century Scotland was often short and brutal because of the inextricable relationship between politics and religion. The policy of religious compromise set out by James VI in 1610, was decisively ended in 1638 when Charles I introduced his plan to "resume possession of all the property in land and teinds ... that the old church possessed in 1540" (a plan which would have left hardly a secular landholder unaffected had it been carried out). This, combined with his attempt to assimilate the practices of the Church of Scotland to those of the Church of England, led to conflict in which "passions of religious feeling were strong enough to eclipse the older feeling of dynastic loyalty".[20] Under Cromwell's military government, Scotland was to have some peace with an enforced measure of religious toleration in which popery and prelacy were, however, forbidden. With the restoration of Charles II, religious compromise, along the lines of James VI, was the order of the day. He brought back episcopacy but integrated "the rule of bishops with a presbyterian structure of kirk-session, presbytery with synod, and was tolerant of the puritan forms of worship that had grown up in the 1640s". This compromise was not as widely accepted by either church or country as that of James VI had been. When, on his succession in 1685, James VII proposed religious toleration for all creeds including Roman Catholicism, the immediate effect was to unite the Scots against the throne. The succession of William III in 1689 eased relations between Scots and the throne. The national Convention of estates worked out a

compromise, that provided the Church of Scotland with a presbyterian government which was to last until 1921. Bishops were abolished and the General Assembly restored, with Synods, presbyteries and kirk-sessions existing as before. In this respect it was overtly presbyterian but simultaneously the "Church remained subject to parliamentary statute and civil penalties for ecclesiastical excommunications were abolished". To this Church of Scotland the majority of Scotsmen of all ranks adhered; the dissenters who formed the episcopalian and Roman Catholic churches as well as other sects represented only a minority.[21]

In politics James VI had shown great diplomacy and skill. He had organized the barons or small lairds in parliament in an effort to offset the predominant influence of the nobles and had directed parliament through the Lords of the Articles (a committee composed of proven friends to the crown) which "took over virtually all legislative power under the guidance of Privy Council". It was the Privy Council that was to lead the general assembly and the episcopate, the Convention of Royal Burghs, parliament and the Court of Session, a policy that backed "central government against faction and abuse of private power".[22]

In politics, as in religion, Charles I created havoc, whereas Cromwell managed to contain powerful rivals with the help of a temporary union with England. Charles II reestablished a government of balance and control by ending the union and re-implementing rule through Privy Council, but this was again lost in the religious conflicts under James VII. The accession of William saw the abolition of the Lords of the Articles and a restriction of the power of Privy Council. What remained of the Privy Council of Scotland soon became divided and as

it had lost virtually all its power it was put into abeyance. In its place a camarilla was established consisting of the 'presbyterian party' which, despite its name, was by this time a political rather than an ecclesiastical institution.[23] The result of the wasteful religious and political conflicts of seventeenth century Scotland, which were such a major part of everyday life, was to divert men's attention from the economic and intellecutal progress which could have led to a general enrichment of secular life.[24]

Nevertheless, Hugh Trevor-Roper exaggerates when he refers to Scotland's seventeenth century as a 'Dark Age'. Despite its turmoil, it was then that the foundations of the eighteenth century enlightenment were laid, in the three institutions - Kirk, Law and School - which played such a conspicuous role in Scottish life. By 1707 the attitude of the Kirk was already noticeably different.[25] Both its original monolithic structure and its former absolute power were being rapidly eroded, by a process which began with the settlement of 1690 and culminated, after the Union of Parliaments in 1707, in the Acts of Toleration and Patronage of 1712. The Act of Toleration, designed to permit episcopalians to meet for worship using the Anglican prayer book, curiously offended their national pride because they feared too close an association with the Church of England. The Act was aimed primarily at reducing the power of the presbyterians. It circumscribed the jurisdiction of the Church courts. The Church no longer had the total and unquestioning support of civil law, and this substantially loosened its discipline. Excommunication lost its material terror and Church courts were unable to retain as firm

a control over orthodoxy as in previous times. Simultaneously, irreparable splits developed within the Church, opening up a variety of possible beliefs. More important, this decay provided individuals with the realization that their personal thoughts and opinions could be of as much value as those of the next man. The Act of Patronage, a final blow to the Kirk's authority, reestablished lay patronage into the sphere of the Kirk which meant less control by the Church itself because vacant livings could now be filled by nominees selected by lay patrons. A nominee was presented and if he was properly qualified and approved by the congregation, he was then ordained and inducted.[26] The decay of the Kirk's absolute power led to the growth of a measure of toleration exemplified by the rise of the Moderate Party. This feeling of moderation filtered out among the populace of Scotland as likewise a similar attitude had arisen among the people of other European countries. People were increasingly of the opinion that some degree of toleration in religious issues was preferable to the endless and costly wars that had been provoked in the name of religion.[27]

This toleration, according to Albert Hirschmann, in The Passions and the Interests, also had a philosophical basis that could be traced back through Hume, Adam Smith and numerous European philosophers to Machiavelli. The concept of interest which was seen to incorporate the better nature of passion and reason, had been developed to explain the dynamics of society. This concept was applied to statecraft in the form of 'national interests' and an international 'balance of interests'. This in turn was applied, during the debates on religious

toleration in Britain, to a conflict-ridden domestic scene. Discussion dwelt on the advantage to the general public interest of both a variety of popular interests and the tension among these interests.[28] It was suggested that far from resulting in an uneasy balance this would create an interlocking web of interests.

By 1752, the unity of the established Church was broken and one of the factions, the Moderate Party, gained the ascendancy within the Kirk establishment. Under the tolerant direction of William Robertson from 1762-1780, its leadership lasted until the 1780s. Under him large scale heresy hunts were prevented. Robertson, being a realist, knew that the great days of the Kirk were over. Theocratic delusions would do no good in an age where the trend was secular. The attitude of Robertson and the Moderate Party, enabled men like David Hume and Lord Kames to express their ideas openly despite bitter attacks at the General Assemblies in 1755 and 1756. Under this party, the Church was made more aware of the secular needs of society. Instead of obliging "all intellectuals to deny their faith before they could get the freedom to think for themselves", the party used its prestige to add to the achievement of secular aims. Thus, the close connections that existed between the Moderates of the Church and the Scottish enlightenment were able to continue. The party "fought to ensure that the Church and the enlightenment could co-exist to their mutual benefit". A reluctant attitude on the part of the Church would have prohibited such connections.[29]

The consequence of the Union of Parliaments in 1707 must also be assessed to determine the influence it had on the country's future

enlightenment. Scotland's relationship with England had always been one of great complexity but since the Union of Crowns in 1603 and, in particular, the Revolution of 1689, this relationship had become even more involved. The Union of 1707 was not easily achieved nor were all of the "important sectors of Scottish society ... easily reconciled with the Hanoverian monarchy and the Union of Parliaments". Equally hard on many sectors of society was the slow materialization of the results expected from Union. Economic benefits, for example, including freedom of trade, did not really begin to appear until the 1730s.[30] For all this, though, the Union, and indeed the period leading up to the Union, did provide Scotland with some advantages. In particular, "the influence of William III and his advisors, especially William Carstairs, had brought to Scottish affairs an awareness of new intellectual currents, coming especially from Holland". The Union then tended to stabilize Scotland's society. Those institutions crucial to the existence of Scottish life, the Kirk, the legal system and the educational institutions, remained intact, while those institutions that had proven divisive in the seventeenth century, the Scottish Privy Council and the Scottish Parliament, were abolished. Between 1716 and 1780, politics displayed little shape or unity mainly because the Union had dismantled one system of government and replaced it with a managerial system controlled from London. The way to London and the life of politics as existing there being a rough and expensive adventure, after 1707 only the upper classes were able to indulge in parliamentary politics, the majority of Scotland's people losing touch with the events occurring in London. With this removal of politics many

members of society, previously caught up in the political activities then began redirecting their time, talents and money to cultural, intellectual and other ventures, particularly in Edinburgh.[31]

While in one sense the departure of parliament removed the compelling force of politics, in another, Scotland's political aspirations remained close to the surface of events, to which the new managerial system merely introduced another potentially problematic level. The Earl of Islay, later the 3rd Duke of Argyll, dominated local government between the years of 1745 and 1761. During this time the authority of a Whig landed aristocracy was confirmed. With the death of Argyll in 1761 and the instability of the government in London between 1763-1770, a suitable replacement failed to emerge. It was not until the 1780s that Scotland had a more or less permanent manager who came in the form of Henry Dundas, Viscount Melville, who was also to become widely referred to as 'King Harry IX'. From 1782 until the turn of the century, this man was to exercise almost complete control over Scottish political affairs.[32]

Yet, the political preoccupation based on religion of the previous century had been destroyed. Whiggery had become an accepted fact of life in Scotland and provided an environment conducive to the Scottish enlightenment. This Whiggery, however, was not synonomous with the 'scientific' Whiggery of the Philosophers, which consisted of a cosmopolitan, cool headed scepticism about political passion and rhetoric. As exemplified by David Hume, scientific Whiggery advocated a detached philosophical approach to politics. Unfortunately, this scientific whiggism was unable to withstand the impact of Dundas in the world of Scottish national affairs. "After about 1780, ... [under

Dundas], the party politics of the nation invaded the Scottish Enlightenment to the overall detriment of the movement."[33]

Certainly, the complete absorption with politics was ended but by its presence, the Union had essentially forced Scotland's people to seek other means of occupying their time. The ensuing atmosphere of stability and the awareness of new intellectual currents gained abroad by Scotsmen since 1690, made an important basis for change but more crucial to the social environment was the nature of Scotsmen themselves. It was the sense of a Scottish or a national identity among Scotsmen which was the primary difference between the achievements they attained and those of their English counterparts. Perhaps it was this identity which allowed the Union to act as a stabilizing force. Prior to the Union, the opposition to, and the frustration connected with this event, meant that there was an intensified patriotism that fostered originality and creative imagination among Scotsmen which tended to find outlets in cultural activities. This feeling was reinforced after the Union when the previous occupation of politics dissipated.

> The complexity of the provincial Scotsman's image of the world and of himself made demands upon him unlike those felt by the equivalent Englishman. It tended to shake the mind from the roots of habit and tradition. It led men to the interstices of common thought where they found new views and new approaches to the old. [34]

The national identity that arose in Scotland kept at bay what Scotsmen considered to be the chief threat to themselves. They greatly feared the encroachment into their society of English influences. For all the impact the Union had on providing stability within Scotland, the influences of the English character felt by Scotland in the eighteenth

century, particularly during the enlightened age, were minimal. Of the relationship that existed between the two countries, Anand Chitnis, writes: "In any political or economic sense, Scotland was clearly a province. However, in sheer intellectual terms, in terms of the philosophy and science which prevailed in Scotland, she was by no means inferior to England".[35]

Apart from the moderation of attitudes in the Kirk and removal of direct political passion, historians have traditionally considered that by the late seventeenth century there was also to be found a solid basis for enlightenment in Scotland's national system of parochial schools, many of which were considered to have even attained the level of being described as grammar schools through their provision of more than just elementary instruction in reading and writing. Legislation had attempted in 1616, 1633 and 1646 to establish parochial schools in every parish of Scotland thereby creating a system on a larger scale than in most European countries. In 1696, a further Act was passed for the settling of schools which in practice did little more than reinforce the existing system. Many of these schools functioned intermittently; the buildings were often little more than hovels, and the standard of teaching did not always reach the level desired by the Education Acts. Yet the scale of the system had traditionally been held to have produced a higher literacy rate in Scotland, than in other European countries, providing a precondition of the coming age. Rab Houston has, however, suggested recently that the system was not entirely responsible for the high rate of literacy, that the high literacy rate was not peculiar to Scotland and that schooling was not as widely accessible as has previously been

believed. Nevertheless, the great majority of Scotland's population did at least attend parish schools for a few years and as Smout has pointed out, "very few of the cultural pathfinders were self-taught". Cant has noted, the school system was "the gateway to all higher intellectual achievement".[36]

The final institution which had already established itself before the eighteenth century and the enlightenment was the University. Within Scotland's five universities, at the turn of the century, there was reflected the same toleration that had begun to be exhibited within the Kirk and by those connected with it. In theory, "the universities had continued to be autonomous corporations [but, in practice, they] were regarded, by parliament, by the Church, and by Scottish opinion in general as part of a national system of education". The universities had a working relationship with the schools which, combined with the low cost of a university education, meant that virtually ever student in Scotland with a reasonable scholastic ability could continue his higher education without undue difficulty.[37] This perhaps is a key distinction between the school system of Scotland and other European countries.

Consisting primarily of teachings guided towards socially relevant occupations of ministers and school teachers, the seventeenth century form of these universities opened their doors, as had the parochial schools, to all ranks of society. While most students hoped to find a place within the ministry, a large proportion of them were forced to accept the positions open in the uninspiring job of parish school teachers. Open to the purges conducted on the orders of whichever ecclesiastical

party was currently in favour, the scope of the learning within the universities became necessarily restricted. While these institutions of learning were inhibited in their range of studies, they nevertheless formed a foundation upon which the subsequent secular opportunities that presented themselves in the eighteenth century could grow.[38]

Early in the eighteenth century the moderation of the Kirk provided a more liberal spirit among faculty and students which was subsequently reflected in the curricula and the teaching methods employed. At the University of Edinburgh these were particularly evident. Some reforms had been attempted since the Revolution and had been carried through to the 1700s but it was probably due to the work of William Carstairs that the University developed so effectively. He was principal of Edinburgh University between 1703 and 1716 and the changes he instituted there were later implemented by Glasgow and Aberdeen Universities. In 1708 he abolished the system of regenting whereby one instructor taught the same class for the duration of the students' studies (which could be of three or more years) teaching only from approved texts - a reminder of the hitherto restricting forces at work in the universities. Carstairs introduced, instead, the system of subject specialization that was currently being used in Holland. Under this regime, specific subjects were taught by specific professors. In addition to this substantial reform, Carstairs worked at increasing the number of matriculated students, establishing new chairs and lectureships and introducing new scientific apparatus. All of these reforms allowed Edinburgh and the other Scottish universities, unlike their English counterparts, to provide modern teachings and to add variety and scope in the courses they offered. Among

the subjects introduced were courses leading to careers in the fields of law and medicine. Such courses were rapidly being developed and expanded, particularly by the Edinburgh and Glasgow Universities. All of this meant that "By the time William Robertson became principal of Edinburgh in 1762, ... Scottish universities were famous through out Britain and Europe for the breadth of their intake from the middle class, for the relative cheapness of their fees, for the excellence and relevance of their instruction, and for the toleration by the university authorities of diverse opinion among the lecturers".[39]

Taking the above points into consideration may help to explain the conditions which allowed men of the intellectual achievement, associated with the Scottish enlightenment, to flourish. The institution perhaps playing the most central role in the enlightenment was the universities. The concerns of the enlightenment were manifested by the changes seen in the universities, and the secularization of society in general was reflected in the secularization within the universities. Three of the most important and influential universities of the enlightenment were located in sizeable cities which already had some measure of political and cultural independence. The contrast in the population of each of these centers between the beginning and end of the eighteenth century serves as an indication of the size of these urban centers and the growth that occurred therein. The population of Edinburgh grew from 40,000 to 70,000, Glasgow from 15,000 to 80,000 and Aberdeen from 10,000 to 30,000.[40]

The Scottish universities were to attain their distinction primarily in fields other than the arts. It was not until very late in the eighteenth century that achievements in this area were anything more than respectable.

At Glasgow, philosophy and mathematics were initially the areas in which the university excelled. Later medicine and medically related subjects came to the foreground. Edinburgh, from the beginning of the eighteenth century, provided exceptional teaching and training methods in law and medicine. In each of these fields, it was fortunate to be able to capitalize on the other institutions within the city's walls. Although the Union turned Edinburgh into a political backwater, it remained the principal center of Scotland largely because it retained the seat of the supreme court of civil law and it was still the meeting place of the General Assembly of the Church of Scotland.[41] In addition, the city housed a cross-section of the whole of society with "peer, preacher and pauper rubbing shoulders", a situation which led to a combination of "pride and poverty, high notions of aristocratic dignity with ... a quaintness of social habit ... [and a] strain of cosmopolitan experience" which made for a keen intellectual stimulus being alive in society. The society of Edinburgh along with its university, between which there was much interaction, made the former an ideal place for the fruition of the enlightenment.[42] Within the university, the School of Law benifitted from the location of the chief legal center in Edinburgh while medicine benefitted by the presence of the Royal Colleges of Physicians (established in 1681) and of Surgeons (which separated from the Barbers in 1722) until the University created its own Medical Faculty in 1726. From this University emerged legal and medical reforms devised by "the enlightened reflections of some of the greatest minds of the age" which were then implemented into society. And yet, although the universities featured prominently in the enlightenment, they did so with "a restraint induced

not so much by conservatism or intellectual timorousness as by a sense of social responsibility".[43] Many of the changes occurring at Edinburgh were also occurring at the other universities and in particular, at Glasgow and Aberdeen.

Apart from the talents of its faculty, a major reason for the University of Edinburgh's preeminence, especially in Law and Medicine, was the unique, non-collegiate nature of its professional organization. The Edinburgh Town Council chose the candidates to fill the positions or vacant chairs. In England, the professors of Oxford and Cambridge worked on a fixed salary which meant that regardless of the number of students they instructed or the number of lectures they delivered, their salary remained constant. One consequence of this was an inertia on the part of the academic staff concerning their standards of teaching and their careers in general. The result was that the fewer the students they were responsible for, the better. Adam Smith, who attended Balliol College at Oxford between 1740 and 1746 as Snell Exhibitioner, "decided that all the benefits were planned there not for the students, but for the masters, many of whom had given up all pretense of teaching". In contrast to this system, professors at Edinburgh literally had to collect their own salaries because their basic wages were too miniscule to support them. They supplemented their stipend by the receiving of class fees. "The class fee system, by stimulating professors to acquire and maintain large classes, discouraged the sinecuring so endemic at Oxford and Cambridge."[44] At the beginning of each term a professor would arrange with the students to receive a fee from those who wished to attend his lectures. This fee was usually two, or occasionally three

guineas. Often the poorer students were encouraged in their studies by being given gratis tickets by the professors. The professors' dependency upon student fees meant that the quality of the classes they taught would be their prime concern. A Scottish professor was more likely to devote more of his attention to his subject matter and presentation than his English equivalent. Naturally, some subjects were more important than others. Into this category fell such subjects as anatomy and chemistry.[45]

One class all students seem to have ordinarily attended was that of Humanities or, as it was alternately called, Rhetoric and Logic or Moral Philosophy. It was usually a two year course of study to provide students with a liberal education. Moral philosophers demanded that even in the sciences study should be based on a sound liberal education if the sciences were to take their place in the academic world. As a prerequisite for other areas of study, the Moral Philosophy course also "enabled a student to keep his later specialized interests in proper perspective".[46] The philosophical cast of the curriculum interacted with the social philosophy of the intellectuals, to produce new disciplines from existing subjects as, for example, political economy from moral philosophy. Similarly, "the development of medicine and medical education boosted subjects previously considered merely as ancillary to medicine, such as chemistry". Practical, as well as theoretical, knowledge was important in the Scottish enlightenment atmosphere. In English universities, theoretical knowledge took precedence over all areas of education, and the final practical training necessary to each profession was neglected; it was left to the students to gain their own practical knowledge. Within the Scottish system, theoretical knowledge

played a crucial role in education, but the application of it to practical uses and the accumulation of practical experience, was considered equally, or an even more important asset to be conveyed to students.[47]

In the field of law, the University was developing a distinct faculty which eventually played a role in the development of a new legal system for Scotland. In 1707, a chair of public law and the law of nations and nature, was established, followed in 1709 with a chair of civil law and in 1722 of Scots law. Prior to the enlightenment, the legal system operating in Scotland was closely linked with continental practise resulting in legal education for Scots being obtained in Leyden, Bourges, Utrecht, Orleans and other continental universities. This situation opened Scotland to many intellectual and social influences and organization. The Roman-Dutch system of law, however, became obsolete as a consequence of the changing circumstances within Scotland. First, with the growth of the Scottish universities, a place was made available for the studying of the law used in Scotland and consequently it was no longer necessary for students to travel to the continent. Second, changes were also occurring in Holland. Holland was adopting a new civil code which replaced Roman-Dutch law, and the Dutch legal faculties in the universities had to accommodate themselves to the needs of the new system. In addition, substantially increased industrialization meant that Scotland needed new legislation to govern the developments and both the Roman-Dutch law and the new Dutch law failed to meet the need. The legal system that emerged in Scotland "related to the Scottish enlightenment through individuals and through the concern that legal and non-legal intellects had for the law as a social discipline".[48]

1681 saw the publication of Lord Stair's Institutions of the Law in Scotland, "the first clear definition and systematisation of Scots law" intended "to provide a compendium of the established rules of Scots law of his time and also to show how those rules formed a coherent and logical whole". It was this work that was to govern legal thought in Scotland for the first half of the eighteenth century. Familiar with the doctrines of natural law as propounded on the continent by such men as Hugh Grotius (1583-1645) and Samuel Pufendorf (1632-1694), Stair's definition of law echoed that of Grotius: "Law is the dictate of reason, determining every rational being to that which is congruous and convenient for the nature and condition thereof". In two respects, however, Stair's doctrines differed. First, he could not regard "a rational theory of law as possibly independent of theological assumptions". His combination of law and religious belief added a "distinctively Scottish element to legal thought". Second, natural lawyers "tended towards a secular set of natural law principles" from which "a complete and self-sufficient system could be deduced by logic", whereas Stair believed this to be insufficient. As Peter Stein noted, "Clearly Stair favoured a system in which the bulk of the law is stated in judicial decisions and would not have advocated codification".[49]

Stair's work resulted in Scots law becoming inextricably bound up with philosophy. The eighteenth century saw a

> tremendous growth of interest in moral philosophy and the enormous scope it was thought to have. The moral philosophers [both legal and non-legal] focused attention on the function of law in ordering men's relations with their fellows in society, and the challenge which they offered to the traditional explanations of the origins and nature of law made lawyers less confident of the absolute character of

> some well-established legal notions and more critical of some legal institutions which had served their purpose. [50]

The literati "'improved' on the philosophical treatment meted out to Scots law by Stair". David Hume proclaimed "The Good of mankind is the only object of all these laws and regulations." Lord Kames expounded on Montesquieu's theme that universal solutions were impossible; to find solutions for the special requirements of different nations, numerous factors such as climate, customs, religion and manners had to be taken into account. What was stressed by the latter half of the century was a concern "that where many cases are brought within the same general rule, the smaller circumstances in which they happen to differ are overlooked; and so decisions according to the general rules may actually produce injustice in some instances". In the view of the literati, Government arose to protect property and to administer law and justice so that society would remain whole. Therefore it was agreed that regular reviews of the system were necessary in order that it would continue to apply to society as it changed. From this a new and unique Scots law was developed, and by the latter part of the century, "the profession was more conscious than it had been of the need to keep the law in touch with the changing social and economic state of the country".[51]

Law in eighteenth century Scotland was a profession that could lead to political advancement and was regarded as a "gentlemanly pursuit and a guarantee of a liberal mind" - the latter aspect was in accord with enlightened thought. As a result of an edict of James I (of Scotland) and an Act of Parliament under James IV which decreed that the oldest sons of barons and freeholders should be instructed in law, in the eighteenth

century the highest reaches of law were monopolized by the landed aristocracy and gentry. Phillipson calculated that between 1707 and 1751, they represented 96 percent of the entrants to the Faculty of Advocates, while between 1752 and 1781 the figure declined only slightly to 88 percent. Composed of such elements it was the legal profession, a small but influential minority within the country, that was largely responsible for the redefinition of polite culture in the eighteenth century.[52]

There was, in the eighteenth century, a trend seen within the University of Edinburgh of an increase in the number of students attending courses of study. With the changes that had taken place, it became beneficial for Scotsmen to attend the universities in their own country. Not only did the quality of teaching improve, assuming impressive standards, but economically, it was cheaper to attend a Scottish than a Dutch university. This move by Scotsmen was supplemented by the number of English students who attended the University in Edinburgh. The Scottish capital city, could offer the atmosphere necessary to educate young gentlemen in the ways of 'polite' society, something Oxford failed to do. In addition to Scottish and English students, students came to the University from the West Indies and the Mainland colonies of North America. These students came mainly to enrol in the best medical programme of the day.[53]

Before the medical faculty of Edinburgh University was founded in 1726, qualification for the practise of medicine was not obtained through any formalized means. Instead, any individual wanting medical training would undergo an apprenticeship of several years to a practitioner,

with only a minimum of academic instruction coming from the corporate bodies of physicians and surgeons. In Edinburgh, these bodies came under a College of Physicians and an Incorporation of Surgeons. These institutions, however, were not very noteworthy between 1690 and the early 1700s due to the political and religious problems of that time which nearly destroyed their intellectual and organizational aspects. Any type of formal medical education sought by Scotsmen was thus obtained through attending a Dutch university. This situation, however, underwent a radical change in the eighteenth century.[54]

1705 saw the appointment of Robert Eliot as the first Professor of Anatomy at Edinburgh University - the first chair of its kind in Britain - but it was not until 1720 with the succession of Alexander Monro primus to that chair and the founding of the Medical Faculty in 1726, that any form of structured medical education within the university began. With "the Surgeon's Incorporation, the Physicians' College, the Town Council, and the University all playing a part in the loose network of patronage, faculties, examination and discourse", the organization of the Edinburgh medical course was very complex. By the end of 1725, though, it was clear that the aim of a comprehensive medical education would be better served if the course was controlled exclusively by the University. With the establishment of the Medical Faculty, regular teaching began in anatomy, surgery, chemistry, medicine, institutes and practice of medicine, botany and midwifery. With the transfer of this control to the Medical Faculty of Edinburgh, there also came a transfer in the right of the Faculty to examine candidates for medical degrees.[55]

For the most part, within the Faculty of Medicine clear distinctions

between the subjects which led to the founding of chairs in these fields, developed only as the specialization of the subjects increased. Thus, for example, in 1739 the Chair of Midwifery was founded while it was not until 1768 that a similar chair in Materia Medica was established. The development did not, however, come to apply to surgery and the profession of surgeons. It is important to realize the rivalry that existed between the physicians and surgeons as each vied to claim larger areas of the medical field for its own practice. As early as 1736 a Surgeon's Hospital was established in the city of Edinburgh but within the Faculty of Medicine at the University. The question of a Chair of Surgery was one of the most contentious issues within the University of the eighteenth century and it was not until 1767 that the Governors of the University's hospital, the Royal Infirmary, agreed to provide clinical lectures on surgical cases equal to those given on physicians' cases. Furthermore, it was not until 1777 that the University finally decided to create a Chair of Surgery separate from the Chair of Anatomy. Alexander Monro, secundus,[56] who held the Chair of Anatomy at this time, was opposed to such an idea and the problem was resolved only when a compromise was reached. The Town Council and University decided that Monro would be made the joint holder of the Anatomy and Surgery Professorships but that such a position would last only as long as Monro held the position. After him, the two chairs were separated.[57]

Along with the 'textbook' education, a good clinical education developed at Edinburgh University. Monro primus, along with Edinburgh's Lord Provost George Drummond, helped establish the Royal Infirmary for the use of the Medical Faculty. It opened in 1729 with six beds and in 1739

a Royal Charter granted that its size be increased to 240 beds and that a surgical theatre capable of accommodating 200 students be included. This opened in 1741 and by 1746 its full capacity was in use. The main drawing card at Edinburgh was the impressive clinical teaching available, but there was also a rigorous programme of observing medical cases, which was indicative of the keen desire for accurate information that developed during the enlightenment period. While giving lectures, John Rutherford, Professor of Medicine between 1724 and 1747, instituted the following method for relating information. For each patient, or case, he would:

1) Give a history of the disease.
2) Enquire into the cause.
3) Give an opinion as to how the case would terminate.
4) Lay down the indications of the disease.
5) Offer the method of cure.

Following in Rutherford's footsteps, William Cullen also used these categories for relating data when he began giving clinical lectures at Edinburgh University in 1757 which were carefully prepared, comprehensive in their view and for the first time delivered in English rather than in Latin.[58]

Instead of attributing sickness to an Act of God or mystical occurrences as had been done in previous times, the medical profession of the eighteenth century began seeking for physical reasons to explain disease. This led to a more rigorous and systematic approach being taken towards the problems facing the scientific and medical men of the day. As with the discipline of Moral Philosophy, the systematic approach had its roots in Newtonian ideas with Newton once again appearing the "patron of empirical method". This thinking was transmitted by the teachers of

all subjects in the latter half of the eighteenth century, to their students. It was evident in the stress that was laid during the enlightenment on the value of the experimental method and practical knowledge. There was a difference, however, between the experimental methods of the moral and natural philosophers. Natural philosophers relied on the control and manipulation of physical features to obtain results, whereas moral philosophers relied in their experimental method, on experience, which they attempted neither to control nor manipulate but from which they nevertheless extracted their general laws.[59]

A direct result of the changes within the universities and the effect of the enlightenment on society was the formation and development of many new institutions and societies. These, of course, were not on as grand a scale as the Kirk and Law or even the universities. Many of them lasted only as long as the movement itself. These institutions are important, however, as indications of the enlightenment. Those societies which appeared in the eighteenth century were not foreshadowed in the seventeenth century as were many of the other achievements and expressions of the Scottish enlightenment. Thus, they cannot be explained as simply being "pre-industrial recreation or as extra-curricular activities". Often social clubs that met weekly for food and conversation, the societies were formed for a number of reasons. First, out of a concern for the pursuit of knowledge, itself. Another reason was a devotion by the men who participated to improvement whether it be the field of economics, medicine, agriculture or any other subject. Finally, societies were formed by and for the students and were of particular interest because they provided a place outside of the classroom where students could

continue debates begun in class. To identify a few of the societies would be beneficial in pointing out the role they had. Often a society would begin under one name but as the years progressed and its orientation of subject matter changed, so would its name. In 1731, the Medical Society of Edinburgh was formed by several members of the Medical Faculty under the leadership of Alexander Monro primus. By 1736 the society had expanded to include a wide range of subjects resulting in the decline of the Medical Society per se but forming in its wake, the Philosophical Society which lasted until 1783.[60]

Another significant society of Edinburgh was established in 1783, namely the Royal Society of Edinburgh. Its objective was to "embrace all those people essential to the prosecution of the Enlightenment". Such a group included the professors of Edinburgh and the other Scottish universities, lawyers, eminent ministers, doctors, surgeons, the aristocracy and gentry. In theory, this society was to contain two branches of study. One under the aspect of the physical and the other, the aspect of literary works. In practice, however, many of the papers delivered at their meetings fell under the 'physical' aspect and consequently the literary branch lasted only about fifteen years.[61]

A Student Medical Society as well was formed in 1734. By 1736, it had a meeting room, provided for the Society's use, in the Royal Infirmary. Here, its members began a collection of books and a library was created. In 1778 it was chartered as the Royal Medical Society, but although it continued to have a medical orientation, other areas of interest were increasingly developed. Only one of many student societies, it is difficult to overestimate the importance of this and the other

societies as a forum for debate and exchange of ideas among students.[62]

By the last half of the century, Edinburgh's Medical Faculty had reached maturity and was an educational success. The increase in student numbers seen within the University as a whole was specifically reflected in the student population in the Faculty of Medicine. The education they received was thorough and had a practical ground unequalled elsewhere.[63] The method of empirical research was ingrained in each student through every subject they had studied.

By the late 1780s, the Scottish enlightenment was passing from its peak of glory into its declining years. There were many factors which influenced this state of affairs including the decline of those hitherto influential sectors of society, the lawyers and the Kirk. The original ideas and integrity of the Moderates in the Kirk was undermined by their long tenure of power and the lawyers of Scotland were no longer playing the literary and social parts they once had. The leadership of the Moderate Party changed hands in 1780 when Robertson retired and was replaced by Principal George Hill of St. Andrews. Following this transfer of leadership there came a complete change in the approach of the Moderate Party. Whereas Robertson had accepted patronage, he had always been careful to retain a substantial distance between himself, and as far as possible his party, and political management. Under Hill, however, patronage was considered the 'law of the land'. Under this new stance, the policy of co-operation between Church and Government advocated by Robertson because he felt each needed the other, was replaced by Hill's determination to augment an alliance with the political leader, Dundas. In the universities, the system employed lost its uniqueness. Also,

the universities began to produce greater numbers of graduates than they could absorb and so many left Scotland for opportunities available in other countries.[64]

To close the discussion on the enlightenment and the Medical School of Edinburgh it is important to examine why medicine was such a popular career for so many and what those men who were the products of the enlightened Medical School did when they left the University. Within Scotland alone, the opportunities for physicians, surgeons and other scientists grew as the eighteenth century progressed. The demand for men in these professions increased as the populations in the urban centers swelled and as the system of roads within Lowland Scotland were improved thus improving communications. Between 1730 and about 1760 there were enough satisfying opportunities within Scotland to keep many of the students of the universities in Scotland. Towards the time when the enlightenment reached its peak, however, the graduates of the universities and particularly the medical students, began to broaden their horizons in looking for careers. Scotland and England had become closely linked during the course of the eighteenth century as the effects of Union began to take hold. The exchanges taking place between the two countries resulted in wider horizons for these medical students. The tradition of succeeding to, and being content with, university positions was no longer as strong. Nor were the benefits of being a physician or surgeon in Scotland always as appealing as practising in London. After about 1770, many of the young men began heading south to other lucrative and personally rewarding opportunities.[65]

By the mid-1770s, the men who had studied and experienced Edinburgh's

medical training and the enlightenment, were out working and making an impact on society. Some students remained in Scotland, ploughing what they had learned back into Scottish society. Daniel Rutherford, an M.D. graduate in 1772, was just such a man. After completing his studies, he spent three years travelling through continental Europe and then in 1775 he returned to Edinburgh to establish his practice. In 1777 he became a Fellow of the Royal College of Physicians of Edinburgh and between 1796 and 1798 he was President of the College.[66]

In contrast to individuals like Rutherford, other students made their presence felt in 'foreign' countries. Two examples of this were Gilbert Blane and Thomas Trotter. Both men had studied medicine at Edinburgh but, as was not uncommon, neither man had 'read' a thesis for the completion of the M.D. degree. This they did not do until several years after leaving Edinburgh. Becoming involved with the Royal Sea Service at about the same time, Trotter became a ship's mate in 1778 and the following year he was promoted to Surgeon's mate. Blane's entry into the service was more auspicious and his position more immediately established. In 1779 he was appointed as personal physician to Sir George Rodney who quickly promoted Blane to the esteemed medical position of Physician of the Fleet.[67]

It is this latter group of medical men, and in particular Blane, who will be of prime interest in the following discussion. The Scottish enlightenment and the effect it had on the men trained within Edinburgh University, was to send medical men into society where they would implement the ideas and modes of thought they had been exposed to. Blane, because of the atmosphere in which he had studied and as a result of what he

learned was to be influential in the area of medical reforms within the British Navy and later, in his dealings with society as a whole.

FOOTNOTES

1) Richard Olson, Scottish Philosophy and British Physics, 1750-1800 (Princeton, 1975), p.19.

2) Anand Chitnis, The Scottish Enlightenment (London, 1978), p.1; Hugh Trevor-Roper, 'The Scottish Enlightenment' in Studies on Voltaire and the Eighteenth Century (Vol. 58, 1967), p.1636; R.G. Cant, 'The Scottish Universities and Scottish Society in the Eighteenth Century' in Studies on Voltaire and the Eighteenth Century (Vol.58, 1967), p.1953.

3) Quote from Dugald Stewart's Dissertation Exhibiting the Progress of Metaphysical, Ethical and Political Philosophy Since the Revival of Letters in Europe found in Gladys Bryson, Man and Society (Princeton, 1945), p.5.

4) Chitnis, pp.5-6; William Ferguson, Scotland: 1689 to the Present (Edinburgh, 1968), p.208; N.T. Phillipson, 'Culture and Society in the Eighteenth Century Province: The Case of Edinburgh and the Scottish Enlightenment' in The University in Society (Princeton, 1974), pp.424-425; Bryson, pp.2-5.

5) Bryson, p.1, Chpts. 7&8; Chitnis, pp.6, 96; Phillipson, p.432; David Daiches, The Paradox of Scottish Culture (London, 1964), p.72.

6) Olson, pp.12,17 also p.15 quote from Dugald Stewart's Elements of the Philosophy of the Human Mind; Bryson, pp.1-2.

7) Olson, p.17 quote from Stewart's Elements.

8) Bryson, pp. 149,155, quote on p.166 taken from Sir William Hamilton ed., Works of Thomas Reid (Edinburgh, 1863).

9) Olson, p.15; Bryson, p. 18.

10) Olson, p.11; Bryson, pp.3,15.

11) Ibid., pp.17,23.

12) Ibid., p. 18.

13) Ibid., pp.15,23.

14) Ibid., pp.21,27.

15) Olson, pp.12,15-16.

16) Chitnis, p.30; Cant, p.1962.

17) Chitnis, p.5; Rendall, pp.9,15.

18) Ibid., pp.15-17; T.C. Smout, A History of the Scottish People (London, 1969), pp.500,503-504.

19) Phillipson, p.424.

20) Ferguson, pp.86-87; Smout, pp.509-510.

21) Smout, pp.65,66,100,101,196.

22) Ibid., pp.106-108.

23) Ferguson, p.1.

24) Chitnis, p.11; Douglas Young, 'Scotland and Edinburgh in the Eighteenth Century' in Studies on Voltaire and the Eighteenth Century (Vol.58, 1967), p.1968; Smout, p.511.

25) Young, p.1968; Chitnis, pp.7,11; Trevor-Roper, p.1635.

26) Ferguson, p.110-111; Smout, p.511; Chitnis, p.5.

27) Smout, p.511.

28) Albert Hirschmann, The Passions and the Interests (Princeton, 1977), pp. 7-56.

29) Ferguson, pp. 126,226; Smout, p.513; Chitnis, pp.46,57.

30) John R.R. Christie, 'The origins and Development of the Scottish Scientific Community 1680-1760' in History of Science (Vol. 12, 1974),

p.122; John Clive, 'The Social Background of the Scottish Renaissance' in Scotland in the Age of Improvement (Edinburgh, 1970), p.226; Smout, p. 240.

31) Rendall, pp.2-3,6,13; Ferguson, pp.86,137.

32) Daiches, p.51; Ferguson, pp.133,234; Bruce Lenman, Integration, Enlightenment, and Industrialization: Scotland 1746-1832 (Toronto, 1981), p.14.

33) Chitnis, p.246; Duncan Forbes, Hume's Philosophical Politics (Cambridge, 1975), p.139.

34) Clive, p.240.

35) Chitnis, p.246.

36) Smout, pp.506,509; Cant, p.1955; Chitnis, pp.14-15,127; Ferguson, pp.94-95; Rab Houston, 'The Literacy Myth?: Illiteracy in Scotland 1630-1760' in Past and Present (Vol.96, August 1982), pp.81-102.

37) Chitnis, p.126; Cant, p.1955; The five universities of Scotland were Edinburgh, Glasgow, King's College Aberdeen, Marischal College Aberdeen, and St. Andrews.

38) Ferguson, pp.96-97; Smout, p.509; Chitnis, p.7.

39) Smout, pp.506-507; Chitnis, pp.132-137; D.B. Horn, A Short History of the University of Edinburgh (Edinburgh, 1967), pp.40-41.

40) Chitnis, p.155; Cant, p.1957.

41) Cant, pp. 1958-1959.

42) Chitnis, pp.30-36; Bryson, pp.6-7; Ferguson, p.86.

43) Douglas Guthrie, The Medical School of Edinburgh (Edinburgh, 1959), pp.5-6; Cant, pp.1956, 1958-1959; Feguson, pp.207-208; Chitnis, pp. 128-130.

44) B. Morrell, 'The University of Edinburgh in the Late Eighteenth Century' in Isis (Vol. 62, 1971), p. 166.

45) Ibid., pp.158,160-161,166; Horn, p.58; Bryson, p.8.

46) Olson, pp.13,18.

47) Chitnis, pp.155,179; Christopher Wordsworth, Scholae Academicae (London, 1968), p.171.

48) Chitnis, pp.78,80,85.

49) Ibid., pp.78,79; Peter Stein, 'Law and Scoiety in Eighteenth Century Scottish Thought' in Scotland in the Age of Improvement eds., N.T. Phillipson and Rosalind Mitchison, (Edinburgh, 1970), pp.148-151.

50) Ibid., p.152.

51) Chitnis, p.86; Stein, pp.156,162.

52) Daiches, p.56; Chitnis, pp. 75,195; Clive, p.228.

53) Horn, pp.66-69.

54) Christie, pp.124,128' Lenman, pp.90-91.

55) Christie, pp.129-130; Horn, p.43.

56) Son of Alexander Monro primus, who previously held this position.

57) Horn, p.57; Morrell, p.166.

58) Ferguson, p.208; Horn, p.56; Dictionary of National Biography Vol. V, commentary on William Cullen (1710-1790), p.280.

59) Rendall, p.21; Olson, p.32; Bryson, p.17.

60) Chitnis, p.196; Olson,p.157; Horn, p.93.

61) Chitnis, pp. 197-204.

62) Ibid., p.207; Horn, p.93.

63) Christie, p. 135.

64) Chitnis, pp.240-242; Ferguson, p.226.

65) Lenman, pp.90,94; Chitnis, p.240.

66) Dictionary of National Biography Vol. XVII, commentary on Daniel Rutherford (1749-1819), p.494.

67) Sir H.D. Rolleston, 'Thomas Trotter, M.D.' in Royal Naval Medical Service Journal (Vol. 5, 1919), p.613.

CHAPTER TWO

> More may be done towards the preservation of the health and lives of seamen than is commonly imagined; and it is a matter not only of humanity and duty, but of interest and policy. [1]
>
> - Gilbert Blane

Gilbert Blane was born on 29 August 1749. He was the fourth son of the opulent Scottish merchant, Gilbert Blane of Blanefield, Ayrshire whose family lineage of well-to-do merchants descended from one Thomas Blane (obiit 1620). After spending the first fourteen years of his life on his father's small estate in the West of Scotland, Blane entered the University of Edinburgh. Originally intending to study for a future position in the Church, Blane spent the first six years of his time at Edinburgh in the Faculty of Arts "obtaining a sound education" of which he provided evidence in his writings, particularly in his Elements of Medical Logick, first published in 1819. In 1769, however, his orientation shifted and he was ultimately led to study medicine. Although there is no direct extant evidence accounting for his change of interests, it would seem that he had decided he could best serve mankind by dedicating his life to the curing of "bodies rather than of souls". Blane's mind, as will shortly be realized, was one that loved experiment, organization and the accumulation of statistics, all qualities found in abundance in the medicine of his day. Having decided upon a career in medicine Blane spent an additional five years at Edinburgh University pursuing the appropriate course of study, but did not graduate. Blane obtained his M.D. degree by proxy from Glasgow University in August 1778.[2]

As a result of his education in Scotland at the height of the enlightenment, there are found in Blane's work many of the ideas expounded by the moral philosophers. Perhaps the sources best revealing his acceptance of these ideas are an address to a body of medical students in 1776, and later, his Medical Logick.

While at Edinburgh, Blane appears to have made a good impression on both his fellow students and his professors. In the company of many of Dr. Cullen's students who where to gain eminence in the medical profession, Blane became a member of the Students' Medical Society of Edinburgh and in 1775 was elected President. That year he presented a paper to the Society entitled 'What is the Nature of Antiseptics and How Do They Work?'[3] When in 1776 the medical students secured a building to house permanently their society, it was Blane who delivered the opening address. This discourse gives an insight into the meetings these students held and the ideas of Blane and his peers while students. It is necessary to quote this speech at length in order to understand the basis from which Blane and his contemporaries drew their knowledge.

He began by acknowledging the work of former members in the growth of the society and proceeded to explain the purpose behind the society.

> The laudable and liberal views of the venerable founders of this institution can never be enough admired ... we know not whether to admire most, the noble enthusiasm of soul, the generous ardour for knowledge, or the sound judgement and ability which first suggested the plan of this institution. Our predecessors perceived that it was not merely the frigid plodding on books, nor the doctrines and precepts of age and authority, nor the little detail of an empirical practice that could inspire that taste and spirit, and give that manly turn to our inquiries, which alone could render

> study agreeable, vigorous, and successful; They perceived, that it was in society alone by their mutual communication and reflection of the lights of reason and knowledge, that the intellectual as well as the moral powers of man are exalted and perfected. I will venture to appeal to everyone's experience, if, in the glow of social debate, he is not conscious of a vigorous exertion of mind, of an energy of thought, unknown in the solitary hour - To discover truth, to detect falsehood, to develop seeds of genius, and to emancipate the mind from the fetters of authority and prejudice were the grand objects of this institution. [4]

Further on, Blane described the composition of the society's meetings and how, through their meetings, the students managed to accomplish the above.

> The members of this Society, all of whom are of some standing in the study of physic, hold weekly meetings, at which they read, in rotation, discourses on medical subjects previously assigned. But, before any discourse be publicly read, it is communicated in writing to every member, and some are appointed to impugn, if necessary, the doctrines which it contains. From these circumstances, the author of every discourse is induced to take the utmost pains to render it as complete as possible; and the other members have an opportunity of coming prepared to point out every other view in which the subjects can be considered ... At these meetings, every opinion which has at any time prevailed, or which subsists, with any credit in the system of physic, is examined with great freedom. Among others, the doctrines delivered by the professors of the university are considered and canvassed with modesty, but without reserve. By this means, these doctrines are more fully understood; and when adopted, are received, not only on the mere authority of a professor; but as a result of the student's own deliberation and judgement. [5]

Blane, further following the guidelines of enlightened thought, confirmed the need for students, and indeed all persons, to support reason and experience or the debating of issues, with illustration and experiment. Through the society students "learned to reason and think for themselves; here they combated prejudice and error, however sanctified

by antiquity and authority; and (what is not to be omitted) it was here that they learned to love and esteem each other, and to cement the bonds of true friendship ...".[6]

In his concluding remarks on the Medical Society Blane noted one overall theme of the enlightenment - the importance of humanity.

> I need not mention to you our improvement in medicine as a lucrative profession, nor the more noble and disinterested regard to our own reputation, and the credit and dignity of the society; I hope, also, that our inquiries are influenced by the love of truth, and that the more sublime consideration of humanity and duty, awaken the benevolence of our hearts, and animate us in our improvement in the healing art. [7]

It was in Medical Logick (1819), however, that Blane wrote at greater length of the application of enlightened thought. Here, Blane wrote that as medicine "has for its object the preservation and restoration of health, it comes under the definition of an Art, a term, the import of which consists in the adaptation of means to ends" which were to be derived "from the previous knowledge of the changes producable by them, whether as corporeal agents constituting physical causes, or as affections of the mind constituting moral causes". To contemplate any end, and "to devise and apply the means of attending it", Blane reasoned, was a strictly mental process, a process which was found only in human beings and which was the one factor that distinguished human from animal nature.[8] The separation of man from beast was an important part of enlightened thought, for as Gladys Bryson has pointed out,

> Man, for them, was never reduced to nothingness, in however large terms they comprehended the universe, because one of their main tasks was to urge man to act significantly and worthily. For the same reason they could not make him out a mere mechanism, for they thought they saw in him evidences of his participation in the character of the

> contriver of the whole machine. With more conviction, they tried to see him as a peak in the scale of nature, much lower than God and the Angels ...but standing higher than the other animals by reason of his intelligence and his speech. [9]

Having established the duties of medicine, Blane turned to a discussion of its philosophy. The "maladies and casualties" that doctors were confronted with were more numerous and complicated within the human species than in other animal species. The complexity of mankind's ailments were, Blane felt, a consequence of the "artificial habits and practices peculiar to rational beings and [were] more multiplied by that superior cultivation of reason which distinguishes civilized from savage life". Blane was aware that although they were rarely subject to disease in comparison to humans, animals had been provided with an instinctive knowledge which led them to "swallow certain simples to relieve themselves from disorders". He wrote that any similar instinctive knowledge humans may have once possessed had been obliterated or at least weakened by their "exercise of reason".[10]

Blane noted that because man's reasoning had resulted in artificial illnesses then it should also be capable of producing artificial remedies. He believed that the art of medicine had command over a great variety of 'agents' that could be acted upon the human body to relieve sickness. "These consist not only in the regulation of diet, of the temperature and purity of the air, and the abstraction of blood, but there is such an ample ... provision made by nature in the productions of vegetable, mineral, and animal kingdoms, so diversified in their peculiar and respective virtues, ... so as to leave no hesitation in interpreting their meaning." Through these 'agencies' and their subsequent application,

made with "skill and judgement, ... the cure and relief" of diseases was to be achieved. In Blane's opinion, the decision had to be made by enlightened physicians because they, as a result of their training, knew whether or not to avail of the art of medicine to treat disease.[11]

In his concern for the health of mankind, the prevention rather than merely the cure of diseases became for Blane the ultimate goal. Of this he wrote:

> for the art of physic is at best but fallible, and sickness, under the best medical management, is productive of great inconvenience, and is attended with more or less mortality. The means of prevention are also more within our power than those of cure ... what we know concerning prevention is also more certain and satisfactory. [12]

In a recent article, Peter Mathias has stressed the point that the analysis of the causes of disease at that time was still almost medieval. Development of cures depended on a more formal understanding of the intrinsic causes of disease than enlightenment doctors possessed. As Blane himself observed, it was a moot point "whether recoveries have been effected by <u>virtue</u> of medicine or in <u>spite</u> of it ... we must frequently run the risk of congratulating ourselves on a great <u>cure</u> where there may have only been a happy escape".[13]

Blane believed that the 'agencies' and the physician's knowledge could only be ascertained by observation and experiment. Harking back to enlightened thought he wrote that it was through observation that "we may be said to listen to nature", and through experiment, "to interrogate her" with "the faculty of clearly comprehending and fairly interpreting the ways and aims of nature".[14] In his 1785 and 1799 editions of <u>Observations on Diseases</u>, Blane warned physicians:

> It behooves everyone who engages in a profession so important, and at the same time so full of ambiguity as that of medicine, to discipline his mind properly with regard to the laws of evidence, and the rules of investigation, so as to draw fair references from facts, to avoid credulity on the one hand, and scepticism on the other, both of which are equally unfriendly to the discovery and application of practical truths. [15]

The ambiguities, which he considered to have obstructed and retarded the importance of medicine, consisted primarily of:

1) the errors and abuses arising out of false or misapplied theory;
2) the great diversity observable in the constitutions of individuals;
3) the difficulty of appreciating the efforts of nature, and of discriminating them from those of art;
4) superstition;
5) the ambiguity of language;
6) the fallacy of testimony. [16]

These pointed to the necessity of "accurate induction, extensive observation and the comparison of facts". Blane's love of statistics was founded on the belief that the collection and comparison of great numbers of facts was "the only true method of cultivating any practical art ... A few individual cases are not to be relied upon as a foundation of general reasoning, the deductions from them being inconclusive and fallacious". He argued that "in order to ascertain truth, in a manner that is satisfactory to a mind habituated to chaste investigation, there must be a series of patient and attentive observations upon a great number of cases, and different trials must be varied, weighed, and compared, in order to form a proper estimate of the real efficacy of different remedies and modes of treatment". [17]

Throughout his entire medical career Blane was to heed his own advice. Of the time he spent with the Navy he wrote, "It has been my

study to exhibit a rigid transcript of truth and nature, upon a large scale, and to take the average of numberless particular facts, to serve as a ground-work for observations; and I have endeavoured to analyse and collate these facts, by throwing the monthly returns that were made to me into the form of Tables". It was not always an easy affair, however, and Blane, like other investigators, encountered difficulties while making his inquiries in the Navy. He found that the inadequacy of hospitals connected with the service, in capacity and equipment, interfered with his observations. Another problem arose while he was Physician to the West Indies Fleet and was a result of the fleet seldom remaining in any one place for more than six to eight weeks "so that any series of observations that might have been instituted was interrupted".[18] This latter problem, however, was more or less resolved by Blane's arrangement to receive the surgeons' reports on a regular basis.

Commenting on obstacles that retarded the progress of medicine, Blane advised the young practitioner against "being misled by the sweeping dogmas of schools, and the indiscriminate practices of sects, or favorite practitioners". He further cautioned these individuals by quoting his own mentor, Dr. Cullen: "there are in physick, more false facts, than false theories [and] it is by the want of due caution with regard to these, that quackery has chiefly been sustained". Blane was particularly critical of those who claimed to be medical men in England. He called attention to the writings of Professor Nemnich, of Hamburgh who had visited England in the last years of the eighteenth century and who referred to the country as "the Paradise of Quacks". Nemnich apparently listed the quackery within England as one of many national peculiarities,

a list which included boxing, horse-racing, and cock-fighting.[19]

In Medical Logick, Blane also examined how medicine had evolved to its contemporary state. He researched this subject going back to the days of Democritus (470-380 B.C.) and his followers, one of the most eminent being Hippocrates (460-377 B.C.). Of this school, Blane wrote "that the cultivation of science, in the early ages of Grecian philosophy, was undertaken on the soundest principles namely, the observation of nature, and the collection of facts". Blane also assigned Aristotle his proper place as a "most diligent observer of nature, and collector of facts", but lamented that it was Aristotle's logical and metaphysical writings that "caught preferably the notice and taste of the learned world, and engrossed its attention for many ages, to the exclusion of all other useful and liberal knowledge".[20]

Hippocrates, like Aristotle, was an accurate observer and collector of facts but one characteristic Blane felt it was necessary to remove from all scientific investigations was Hippocrates propensity, as was common to that and all ages, to "assign causes, however lightly and hastily, manifesting itself in hypothetical and gratuitous assumptions of general principals". As an example, Blane pointed out that Hippocrates had attributed "all diseases to excess, defect, or vitiation of the four humours, blood, phlegm, black bile, and yellow bile". Blane warned physicians to make this example a "beacon and [to] safeguard against the premature generalization of facts, which, in our times, is considered as one of the most sure criterions of an inferior capacity, or untutored mind". (my italics)[21]

Blane's analysis of the history of the state of medicine then took

a leap forward to the time of Francis Bacon (1561-1639) who he credited with "dissipating the clouds of false philosophy, and for pointing out the road which led to solid learning, and the discovery of interesting truths". Nevertheless, Bacon "affords a proof how necessary it is, that the mind should be subjected to a long course of discipline, in order to bring it into correct habits of thinking on matters", because, although his chief merit lay in his recommendation of the use of the inductive principle of observation, he, himself, was still affected by the credulity of the times in which he lived.[22]

Looking to a period closer to his own time, Blane wrote that towards the end of the seventeenth and the beginning of the eighteenth centuries academics began to "perceive that life was regulated by laws peculiar to itself, and that some other principles other than those of mechanism and chemistry, ought to be resorted to in explaining the operations [of life], whether of health or disease". Progress was made, Blane claimed, with "a fair prospect of a more legitimate system of reasoning being established" in medicine, at least until the appearance of Dr. Boerhaave in Holland at the beginning of the eighteenth century some of whose teachings, retarded this progress. He described Boerhaave as a "man of uncommon capacity, great erudition, and indefatigable industry, and a zealous and honest searcher after what he conceived to be the truth". Boerhaave, however, probably as a result of constantly applying ideas from chemistry, his favorite area of study, allowed himself to "be deluded into what is now viewed as a most fallacious train of reasoning", particularly in his theory on inflammation and in his principles of humoral pathology which "referred the cause of a large class of diseases,

to certain acrimonious conditions of the fluids". Blane maintained that Boerhaave's doctrines enjoyed an exalted position among "schools of physick" and "the practitioners of all Europe" for about fifty years simply because he delivered his theories in such imposing language. Blane expressed great surprise that "the assent of an enlightened age should have been so won over to a body of doctrine so puerile and shallow". And yet, although Blane was against much of what Boerhaave represented in medicine, he did credit him with the improvement and diffusion of rational chemistry during the early eighteenth century.[23]

In concluding this discussion on Blane's thoughts on the evolution of medicine, one can quote the following passages detailing the essentials of the 'practice of physick'. Like other enlightened Scotsmen, he believed that "the knowledge of nature, in all its branches, is an indispensible requisite in the cultivation of the mind. It is highly useful, were it only as a gymnastic exercise of the understanding, by that salutary discipline of the mental faculties, implied in the acquisition of habits of attention, and the practice of the reasoning powers". In this category he seems to have placed the subjects of physiology and pathology which he thought were of little avail in the 'practice of physick' but which were important as "branches of education" because they armed any physician with knowledge to be used against "the influence of fallacious theories. But," he wrote, "if the benefits derivable to medicine from physiological science are so limited, from what other and better source is improvement to arise? The answer is, from accurate observations; in other words, from enlightened empiricism". He elucidated:

> By empiricism, is vulgarly understood that knowledge of

> the virtues of diverse medicines, which are supposed to have been ascertained by experience, as applicable to their respective maladies. The number, variety, and complications of disorders, is such, that the most acute exercise of judgement is called for to discriminate cases, to adapt the treatment to the infinite diversity which occurs in actual practice, and to ascertain the most advisable methods, all which can only be effected by applying the rules of induction. That is, of enlightened empiricism, together with such lights as can be gathered from chaste and sober theory. [24]

One final word on Blane's attitude to the physician's role in society. Bringing in a humanistic element he wrote that the physician "is bound not to desert his patient ... He will also ... feel it incumbent on him ... to administer the moral remedies of consolation and sympathy, and to assuage the anguish of despair ... Those who conceive the whole art of medicine to consist in wielding the powers of the Materia Medica, entertain a narrow and unworthy conception of their own duty, and that of the value and dignity of their profession".[25]

Blane enjoyed the respect of his colleagues and became friends with many of the professors within the University. These included Dr. Robertson (the Scottish historian), Dr. Blair (known as an author of sermons), and Dr. Cullen (Professor of Practice of Physick as of 1773). Indeed, it was the last who was responsible for introducing Blane to Dr. William Hunter, the famous anatomist, and for opening the door to his later career. Hunter, himself, was a Scotsman, born in 1718, who had studied at Glasgow and Edinburgh Universities before moving to London in 1741. He took his M.D. degree from Glasgow in October, 1750. Blane, having left Edinburgh in 1776 before completing his degree, moved to London to complete his studies under Hunter, and attended lectures

given by Hunter on anatomy and surgery.[26]

Blane's connections with these influential leaders of Scotland were to make a lasting impression on the young man. Dr. Cullen's teachings were especially important in forming Blane's thoughts. His later opposition to the traditional view of humoral pathology held by Boerhaave stemmed from Cullen's teachings. Blane's references to his mentors in his writings indicates that he certainly was aware of their influence on his own thoughts. In a footnote to Observations on Diseases (1785), Blane wrote that he had "adopted the doctrine of his much-valued master, Dr. Cullen" and that he was "happy in an opportunity of acknowledging his obligations to this learned professor, to whom the medical world in general is so much indebted, as well for the rational views of the animal economy, which he teaches, as for that spirit of study and inquiry which he infuses into the minds of his pupils".[27]

Of Blane's relationship with Hunter, R.S. Allison wrote "we know that Blane was Hunter's pupil and that Hunter assisted him to start his practice, but it is possible that he did more - that he instilled the urge for patient investigation in his mind ... ". Blane's contact with Hunter continued during his career in the Navy. For instance, he wrote to Hunter of the effects of a hurricane experienced in the West Indies on 10 October, 1780, and his observations on the mending of the health of the inhabitants on shore. Hunter was sufficiently impressed with Blane's report to relate the incident to the Royal Society. In other references to Dr. Hunter, Blane wrote of him as "my highly respected friend, the late Dr. William Hunter of London, whose name will ever be illustrious as a teacher and improver of anatomy, as well as a man of high literacy

and scientific accomplishments".[28]

While in London under Hunter's tutelage, Blane found many doors opened to him. Hunter arranged for him to become the personal physician to the last Lord Holdernesse, a man very much in favour at court. Through this connection Blane gained entrance to London society and subsequently met Admiral George Rodney. In 1779 Blane became Rodney's personal physician, accompanying him in this capacity on his expedition to the West Indies on board H.M.S. Sandwich. Unlike two other Scotsmen who were influential in medical reforms in the Navy, James Lind and Thomas Trotter, Blane did not obtain his position within the Navy by working his way up through its ranks. One factor accounting for this difference was that Blane was one of the prestigious group of physicians whereas Lind and Trotter entered the Navy in the less prestigious capacity of surgeons. Blane was to obtain his position of Physician to the Fleet through Rodney's appointment of him directly to that rank early in 1780. Rodney was influenced in this action by his good opinion of Blane's professional skill and because Blane had shown himself to be courageous while the fleet was under fire, conveying Rodney's orders to the officers at the guns in the absence of executive officers.[29]

Before entering into a detailed account of Blane's naval career it is necessary first to note the medical state of the Navy. Prior to the eighteenth century, the incidence of disease among seamen was on the increase while in this century it was to reach an unprecedented level. As Blane wrote in A Brief Statement of the Progressive Improvements of the Health of the Royal Navy (1830),

> In remote antiquity, and in the middle ages, the calamitous

> disasters at sea, took rise from the insufficiency of human means in controlling the elements; and they were also more frequent than in modern times by the less perfect construction of ships, and from their not being able to venture far from land before the invention of the mariner's compass, whereby they were more exposed to the operation of storms, by foundering at sea, or by being stranded on rocks or shoals. But since mankind have learnt to traverse oceans, evils unknown to our ancestors have arisen more hostile to human life than rocks, shoals and storms; for since the invention of the compass more seamen have perished by the scurvy and fevers than by all other causes inseparable from practical navigation. [30]

By the end of the eighteenth century much had been done to reduce the terminal effects of the diseases but it was not until the close of the next century that they were finally overcome. The diseases that caused much of the destruction within the Navy were known as the 'true sea diseases' which included, in their ancient nomenclature, scurvy, the fevers, and the fluxes. Not until the late fifteenth century did scurvy appear on ships on a large scale. At this time attempts were made to round the Cape of Good Hope and with these attempts came large scale sickness and death among crews while at sea, caused primarily by scurvy. As is now commonly known, this disease was a result of the body having a deficiency of water-soluble Vitamin C. Vitamin C can readily be found in actively growing plant life and even to some extent in raw milk and fresh meat, but little, if any, of these foods were supplied for the dietary requirements of the seamen. Their diet was great in quantity but exceedingly poor in nutritional content. The consequence of this lack of ascorbic acid, the active principle of Vitamin C, after an extended period of time was scurvy and ultimately death.[31]

Until much later than Blane's period, the cause of different types

of fevers was unknown and consequently a clear distinction was not drawn among the various fevers, the broad range being collectively referred to as 'fevers'. Included were typhus, typhoid, the plague and, in the tropics, maleria and yellow fever. The fevers were, like scurvy, responsible for numerous deaths among seamen, typhus being perhaps the most devastating. It is now known that typhus is transmitted to humans by lice. This disease easily assumed epidemic proportions on the ships because ideal conditions existed for the disease to be transmitted. Apart from the rats each ship inevitably carried, vermin-infested clothing, particularly among non-regular seamen, was the rule rather than the exception especially if these men were taken from the prisons or were pressed for service. The clothes worn by pressed men were often already infested and through subsequent contact all men on board were exposed to the potential hazards of typhus. In 1756, an English fleet sent to America lost two thousand men from 'ship-fever' or typhus.[32]

The final category of the true sea diseases were the 'fluxes' or diarrheas. There were several causes for the fluxes but, again, the divisions were not clearly or adequately recognized. Of primary concern was dysentery, either bacillary or amoebic, supplemented by acute gastroenteritis, which was spread by impure water supplies. The fluxes usually appeared among seamen debilitated by long periods at sea without fresh water supplies or recuperating from fevers and other illnesses. When they struck, the fluxes did so in epidemic proportions and there were no specific lines of treatment.[33]

The devastating effects of these sea diseases were well realized

and were taken into consideration when a ship was being manned. It was known that the larger ships would be more prone to attacks of these diseases in epidemic proportions than the smaller vessels. Allison gives the following ratios in his book Sea Diseases: "In a 20-gun ship, one-tenth of the crew might be expected to become victims; in a 60-gun ship, one-fourth; while in a seventy or eighty-gun ship the proportion of sick would probably be one-third of the total complement." The number of men placed on board tended to correspond to the predicted number that would be lost and so the crowding of men on board was severe.[34]

The increase in the occurrence of diseases prior to the eighteenth century really only began in the late fifteenth century. By looking at the records of earlier voyages, Allison determined that while there were numerous references to shipwrecks and other elemental hardships little is mentioned of sickness and pestilence until about the middle of the sixteenth century. It was as if the 'ancients' enjoyed the same good health as have seamen of the last hundred years.[35] If this were the case, then it is important to discover why the 'ancients' enjoyed healthy ships, and why, between the sixteenth and eighteenth centuries, there was such an increase in disease on board ships.

The increase in the incidence of scurvy was in proportion to the increased length of a ship's voyage and so this problem seems to have been largely avoided by the 'ancients' (for example the Phoenicians and Norsemen) because they did not undertake lengthy voyages. With the start of extended voyages in the late fifteenth century, seamen began sailing for long periods without access to land and fresh food. Although there was an ample quantity of food, the virtues of a balanced

diet were unknown and fresh food was seldom included among a ship's victuals. Vitamin C was non-existent except for traces found in the beer, resulting in epidemic outbreaks of scurvy.[36]

Apart from lack of fresh food, the victuals supplied were often in an appalling state as a result of the disorganization and illegal practices of the victualling department in the requisition and distribution of supplies and the unsatisfactory means of preserving food. The sailors complained, rightly, of the quality of their food. Tobias Smollett, author of Roderick Random, served as surgeon's mate on board H.M.S. Cumberland in 1739. His experiences on board that ship provided the first hand experience which qualified him, in the following passage, to describe the typical state of food aboard ships. Fresh water was always extremely welcomed by sailors "especially as our provisions consisted of putrid salt beef, to which the sailors gave the name of Irish horse; salt pork of New England, which though neither fish nor flesh, savoured of both; bread from the same country, every biscuit where of, like a piece of clock-work moved by its own internal impulse, occasioned by the myriads of insects that dwelt within it ...".[37]

As with scurvy, the 'ancients' seem to have been more or less immune to the fevers and fluxes. Yet the 'ancients' were no more concerned with personal hygiene or food quality than were the sailors of the sixteenth, seventeenth and eighteenth centuries. Two aspects of naval life that could account for this disparity are the use of impressment and the differences in ship construction. From about the sixteenth century the difficulty of obtaining recruits for the Navy in war time led to various expedients, the most common method being impressment.[38] It

was probably impressment more than any other single factor, which accounted for the drastic increase of fevers and fluxes between the sixteenth and eighteenth centuries.

In Queen Elizabeth's reign the proportion of men required to keep the Royal Navy in readiness was one sailor per 700 of the general population. At the end of the eighteenth century, despite a much larger population, the ratio was up to 1:133. Translated into rough figures, the demand for seamen grew from a little over 7,000 in the Elizabethan navy to 85,000 in 1794.[39] The great number of men required combined with the unpopularity of the sea service explains why it was difficult to find a sufficient number of sailors and why drastic measures had to be introduced. From the Vagrancy Act of 1597 in the Reign of Queen Elizabeth impressment became a common feature.[40]

Under impressment, a press gang was sent out to seize off the streets, any unguarded persons, often regardless of their rank or position, and allowing the victims to take only those possessions they had with them. The impressed men were taken to waiting ships to be employed as seamen for as long as their services were required. Although the gangs preferred to seize men with some sea experience, if the need were desperate, they would move steadily inland taking hold of whoever they could find until they had sufficient manpower. In the eighteenth century when large numbers of men were required to keep the Navy functioning, often only a quarter of a ship's company would be composed of genuine volunteers and experienced sailors. The demand for men was so great that tramps, vagabonds and prisoners, all clad in filthy clothes, were taken to sea along with clean and healthy men of peaceful occupations on land.[41]

Medically, then, the system of impressment was unsound. The infected and diseased men among the recruits were not kept separate from those who were healthy. Nor were new recruits cleansed in any way before joining a ship's company. The diseases carried by a few were quickly spread in the overcrowded conditions on board. The system of impressment necessitated that recruits be kept under strict supervision and rarely allowed off ship while in dock. Also, it was often possible for a recruit to finish his stint on one ship only to be immediately transferred to another vessel. In this way sea diseases were transferred to healthy ships. Under such conditions the three sea diseases, and numerous other forms of illness thrived.[42]

The second factor in the increase of sea diseases was the change in ship construction during the period. Gunpowder was the primary factor in the change in ship design after the sixteenth century. With the use of gunpowder, ships came to be built on a heavier and broader scale with two and sometimes three decks so that they could be more heavily armed by superimposing the guns one on top of the other. This, unfortunately, led to problems of hygiene. In the two-decker ship the 'lower' or 'main' deck would be completely closed off as were the 'middle' and 'lower' decks of the three-decker ships. In addition, the 'orlop' deck and hold, which lay beneath sea level and therefore did not have any portholes or gunholes, were completely closed in. The hold, the only large enclosure of the ship, held stores (ropes, sailcloth, magazines) and ballast while the 'orlop', which lay between the hold and the gundecks, was used for storing food and cables and housing the steward, the midshipman, the master's mate and the surgeon's mates. The gundecks of the vessels were divided into narrow

compartments to house the guns but they also housed the main body of the crew. The only artificial means of ventilation was through the gunports and hatchways. In bad weather, when these sources of ventilation were closed off, the foulness of the air between decks increased considerably which, apart from the effect on the crew, did little to help the condition of food and drink in storage.[43]

Compared to their predecessors, these ships were larger in overall size and capable of utilizing more spars, sails and gunnery thereby requiring a greater number of seamen and gunmen. Although upgraded from a military point of view, the ships had a devastating effect on the crews who served on them. In the multi-level ships, crews lived in a perpetual state of over-crowding and the ships became an ideal breeding place for infection; the cockroaches and rats infesting the vessels were a potent cause of the spreading of disease. The rats, gnawing at sealed casks of provisions, easily spread disease through their faeces and their fleas. It is said that on occasion rats were so common on ships as to provide an additional source of food.[44]

The seventeenth and eighteenth centuries saw more changes and improvements in the style of ships to increase sailing power and gunnery efficiency. These changes, however, were primarily on the exterior of the ships and it was not until the nineteenth, with the introduction of steam powered engines, that major alterations were made to the interior of ships. Man's ability to improve ship design, gunpower and seamanship, outstripped his capacity to recognize the consequent problem of disease which wasted the nation's resources of seamen, yet without seamen ships were useless.[45]

It was not until the late eighteenth century that naval authorities made any significant efforts towards improving the medical situation of the Navy's common seamen. Henry VIII had made some medical provisions for the Navy when he granted a royal charter to the Company of Barber-Surgeons thus establishing a link between this Company and the fleet. This connection lasted until the reign of George II (1727-1760), but the efforts by the naval authorities and the Barber-Surgeons were minimal. As early as 1593 Sir Richard Hawkins voyaged to the south seas and when scurvy broke out he prescribed the eating of oranges and lemons. His treatment was successful. Similar successes occurred under Captain James Lancaster during his voyages of the late sixteenth and early seventeenth centuries. Yet, although both men recorded their experiences, the authorities failed to take note and no attempt was made to implement this remedy in the Service. Instead, the Admiralty and the Barber-Surgeons Company had the idea that scurvy was a disease that attacked the "slothful and idle rather than the energetic hard worker". Added to this, naval officers were little more inclined to sponsor reform. Perhaps they were unwilling to incur the wrath of the Admiralty by insisting on change. More probably, they were simply indifferent to the miseries of the common sailors and their minds were hardened to the hazards of sea life after having lived through them.[46]

In the eighteenth century sea disease reached phenomenal proportions. This century saw the British Navy allied with the Dutch against the French and the Spanish. The task that the British and Dutch undertook included sending ships to the West Indies and other distant places, while trying to maintain a blockade of the Western European seaboard by keeping

squadrons of ships at sea for months on end. Both the Dutch and the British were equally well equipped with ships and seafaring skills. On the question of health, however, the Dutch often outshone the British, primarily because the diet of their seamen was of superior quality in consequence of their recognition of the importance of fresh foods. The British Navy not only provided an inferior quality of food for their sailors but in difficult times they often provided an inadequate allowance of provisions, sometimes supplying six men with a food allowance for four. Along with inadequate diets, as in the sixteenth and seventeenth centuries, no measures were taken to ensure the cleanliness of crews or ships and diseases ran rampant. In the British Navy the death rate from disease considerably outweighed the death rate from fighting. Ships sent to the tropics and the Mediterranean, apart from having to contend with scurvy, fevers and fluxes, were faced with the additional diseases of malaria and yellow fevers.[47]

In 1740, the highest death rate yet seen from disease, was recorded on the voyage of Commodore George Anson. He set sail on 18 September from St. Helens with five ships in the fleet. By 21 December, when they arrived at St. Catherine's in Brazil, a fever had inflicted itself on much of the crew. On 18 January 1741, they resumed their voyage to Juan Fernandez and as they rounded the horn, scurvy had begun to take its toll. Arriving at Juan Fernandez in April it was found that 626 out of 961 men had succumbed to diseases, primarily scurvy. Even for ships that were on convoy or patrol duty in the channel, scurvy, and other diseases, were very much in evidence. As late as 1779, after a cruise of only ten weeks, the Channel Fleet put in shore at Haslar, the Royal Hospital, with at

least 2,400 cases of scurvy, this figure accounting for only the most extreme cases.[48]

In the late seventeenth and eighteenth centuries, sick seamen on board Navy ships were treated in the 'sick-berth' of the ship. This was a space partitioned off by canvas or wooden screens and situated, until the mid-eighteenth century, either on the forward part of the upper gun deck beneath the forecastle or in the fore part of the hold. The value of these sick berths was negated by their location. The former location was in the dampest part of the ship while the latter, although dry, had little ventilation and was subjected to the stenches emanating from the bilges. Apart from poor location, sick berths were primitive, lacked any comfort and were incapable of accommodating large numbers. When an epidemic broke out the sick were usually treated where they lay - in their hammocks.[49] Turning once again to Tobias Smollett, he wrote of Random's first trip to the sick berth:

> ... but when I followed him with the medicines into the sick-berth or hospital, and observed the situations of the patients, I was much less surprised that people should die on board, than that any sick person should recover. Here I saw about fifty miserable distempered wretches, suspended in rows, so huddled one upon another, that not more than fourteen inches space was allotted for each with his bed and bedding; and deprived of the light of day, as well as fresh air; breathing nothing but a noisome atmosphere of the morbid steams exhaling from their own excrements and diseased bodies, devoured with vermin hatched in the filth that surrounded them, and destitute of every convenience necessary for people in that helpless condition. [50]

In the latter part of the century the sick berth was more often to be found under the forecastle and according to Blane it was "furnished with

all the requisities of a hospital, and with access to the head for necessary purposes".[51]

One positive result of the inability of ships to cope with epidemic proportions of patients was the introduction of hospital ships. As early as 1608 England employed one such ship - the Goodwill. In 1654, two similar vessels were used on an expedition to the West Indies. These instances, however, were isolated and it was not until the closing decade of the seventeenth century that a more regular practice was established of setting aside vessels to be used as hospital ships. The ships that were used were old 'sixth rates' or 'merchantmen' which would have seen previous service. After their fighting days they were reconditioned inboard simply by cutting ventilation holes in their sides and removing the partitions on the gun decks leaving the whole floor open for patients. Some credit must be given to the Navy for supplying these ships but they were extremely crude and while they did represent an advancement in the care of sick seamen, the number in commission at any one time until 1740 was never greater than half a dozen.[52]

A real achievement within the Navy before 1750 was the establishment of a Royal hospital for naval men. As early as 1666 a suggestion had been put forth for an infirmary at Chatham but nothing materialized. In 1741, the Board of Admiralty took up the cause but it was not until 1744 that any positive results were realized. By 1745, work on the Royal hospital at Haslar had begun. It overlooked Portsmouth Harbour and Spithead and was so located that the ships could bring their patients within 300 yards of Haslar's main gates. Although construction was not completed until 1762, by 1754 Haslar was open and receiving patients.

It was capable of accommodating 1,800 patients and once open, to took on those patients of the ship hospitals who had originally been transferred from their own ships. These medical arrangements were, however, for the most part inadequate to counteract the overwhelming effects of the sea diseases.[53]

Within these medical institutions what type of medical attention did the patients receive and who administered these services? The medical men who were the most numerous on the ships of both the Royal Navy and the Merchant Service were the sea surgeons comprising surgeons and surgeons' mates, men first introduced to the Royal Navy in the reign of Henry VIII. The surgeons had no special uniform to indicate that they were of the medical profession; they held only warrant rank and while their names appeared alongside the boatswain, the gunner and the carpenter, their pay was less than these worthies. Indeed, naval surgeons were regarded merely as craftsmen. The surgeons were obliged to act in the combined lot of physician, surgeon, and apothecary. Their duties, as laid down in 1731 by the Admiralty in its regulations for the care of sick on board and the conduct of surgeons, in periods of inaction included visiting rounds conducted twice a day or more often if required, supplying the captain with a daily sick list, and keeping journals to record all surgery and diseases under the surgeon's direction. When there was fighting, the surgeons' place was in the hold where they would await the arrival of the wounded. The surgeons' biggest enemy was the sea diseases. They fought desperately but were handicapped by a lack of knowledge and by a lack of support from the members of the higher naval ranks.[54]

To help him perform his duties, a surgeon would have one or two

surgeon's mates. These mates, who usually possessed only the barest of education, would eventually fill a future position as surgeon. The position of surgeons and mates was neither comfortable nor rewarding and so finding the right sort of man to fill the job was a perennial difficulty. During war time it was especially hard to recruit sufficient numbers. In 1780, the number of sea surgeons rose to 370 and in 1783 to 450. The Navy was forced to accept or even impress medical men of inferior qualifications.[55]

Still, the eighteenth century saw an overwhelming interest by Scotsmen in the Navy not only as seamen but also as surgeons and surgeon's mates. Much of this can be attributed to the impecunious state of the Scotsmen who converged on the Navy Board Office in the hopes of gaining such a position. Before obtaining their warrant from the Navy Board, they had to be examined by the Surgeon's Company and many of the Scotsmen who attempted the examinations had the asset of having trained in surgery at Edinburgh or Glasgow. Such was the situation in the cases of Smollett, Lind, Trotter, Robert Robertson, and many others.[56] Smollett gave some indication of the proportion of Scotsmen who applied when he described Random's experience of taking the necessary examination at Surgeon's Hall. One of the first questions asked where he had been born. Random replied that Scotland was his birthplace to which the examiner responded: "I know that very well; we have had scarce any other countrymen to examine here; You Scotsmen have overspread us of late as the locust did Egypt."[57] Peter Cullen, a Scotsman who had attended Glasgow University for only a year, had been apprenticed to a Dr. Wingate, and had then taken the examination in December, 1789 to try for a position as surgeon on a

frigate, expressed the concern felt by all Scotsmen applying to the Navy Board. He wrote that "he got over the examination much better than he expected. For he had been led to believe that the faculty of London were not so well disposed towards candidates from Edinburgh from a spirit of envy.".[58]

A major difficulty that the surgeons had to contend with concerned the supply of drugs. On appointment to a ship, a surgeon had to buy the drugs he thought necessary for each voyage. Included in the surgeon's pay was some money for this requirement but never enough. Not until 1796 were some drugs supplied for the surgeons. This responsibility was an unfair burden on the surgeons and did not encourage them to obtain adequate amounts of the necessary drugs. The situation was further aggravated in 1703 when the Company of Apothecaries obtained a monopoly of the drug supply to the Navy. Not only were the prices the Company charged considered by the surgeons to be high, but the quality of their drugs was also questioned by the surgeons. It was only in 1804 that the Admiralty took over completely its rightful duty from both the Company of Apothecaries and the surgeons and began to supply all drugs to the ships at no expense to the surgeons.[59] For too long the responsibility for the quality and quantity of drugs had been in the wrong hands with the result that inadequate supplies were available to treat the sick; again the seamen paid the price.

Participation by physicians in the administration of Navy medical services was limited compared to that of the surgeons. Physicians were of a higher status than surgeons by virtue of the fact that their profession had been established much earlier, their London College

having been founded in 1512, and because they underwent a more extensive learning programme including completion of a medical degree. Combined, these factors meant that the physician was a more honoured and better paid officer. As a result, the Navy Board of the Privy Council looked to the Company of Surgeons to supply the Navy with cheaper medical officers. The Board looked to the College of Physicians only to nominate men suitable to fill the prestigious positions of Physician to the Fleet or Physician to Naval Hospitals. Indeed, many of the physicians in the Navy did not even come to their positions via the College of Physicians. Instead, they were often a personal physician to an Admiral who appointed them to their posts or they were naval surgeons promoted to the rank of physician after taking a medical degree. The lack of demand for physicians rendered impressment unnecessary, unlike the case with surgeons and surgeons' mates.[60]

As fleet medical officers, physicians were under the orders of the Admiral or Commander-in-chief. Living either in the flagship or in the hospital ship, if one were present, their duties included supervision of the surgeons, examination of reports of the sick-returns and stores, and consultation, an extension of the function of the College of Physicians in providing advice to the Admiralty on questions of drugs and victualling. This advice, particularly before the late eighteenth century, was "often as obscurantist as the opinions of laymen themselves" as was the case in 1740 when the College, asked for its opinion about Antiscorbutics, proposed the internal use of vinegar which was thought would be "greatly conducive to the health of seamen particularly in preventing scurvy".[61]

Throughout the eighteenth century there were examples of Scottish

surgeons and physicians in the Royal Navy who saw the need for reforms in naval medicine. One important advocate of reform was James Lind (1716-1794) who began his medical career in 1731 as a registered apprentice to George Langlands, Fellow of the Royal College of Surgeons of Edinburgh. Lind entered the naval service in 1739 as a surgeon's mate. Almost immediately he became aware of the need for change. For the next nine years he devoted his attention to the medical needs of the Navy. Returning to Britain in 1748, Lind travelled to Scotland where he took his M.D. degree at Edinburgh. By 1750 he had been elected as a Fellow of the Royal College of Physicians and in 1758 he was appointed Senior Physician at Haslar Hospital, four years after it opened. He retired in 1783.[62]

During his years of active service, Lind was interested in all areas of improvement, though his major interest was to reduce the effects of the sea diseases, in particular scurvy. One of his longest cruises was a ten week tour of duty in 1747 as surgeon on the 60-gun ship H.M.S. Salisbury during which 80 of the 350 member crew fell victim to scurvy. Probably this experience, along with reports of Anson's disastrous voyage (1740-1744), brought home to Lind the need to study naval medical problems. A forerunner of enlightened thought, Lind was of the view that experiments were necessary to prove or disprove a belief and that experiments had to be conducted through scientific methods. He wrote that because "'knowledge in physic can only be attained by a series of observations, we must therefore add to our own experience that of man who lived before us, carefully separating truth from hypotheses [rejecting] a great deal of rubbish' [that] needed to be thrown overboard".[63]

In getting rid of the 'rubbish' Lind discarded numerous prominent views held by contemporaries. One of his main targets was the work of Dr. William Cockburn (1669-1739) who joined the fleet in 1694 and concluded his career as Physician at Greenwich in 1739. During his time in the Navy there were no advancements in naval medicine. He had published a book titled Sea Diseases in which he followed the theories of Boerhaave as to the causes of scurvy. Like Boerhaave, Cockburn attributed the disease to congenital laziness and indigestible food though he rightly condemned the view held by Boerhaave that bad air at sea was a cause. While Lind still believed that indigestible food might be a contributing factor to the disease, he disregarded the other causes. He was equally selective as to what treatments should be used for the disease. Earth baths, elixir of vitriol, tar water, and salt water, he considered to be 'rubbish' and endeavoured to provide proof of his own choice - oranges and lemons.[64]

While on the cruise of 1747, Lind conducted dietary experiments the results of which were published in his A Treatise on the Scurvy (1754). "I shall propose nothing", he wrote in the introduction, "merely dictated by theory; but shall confirm all by experience and facts." His experiment consisted of twelve cases of scurvy placed in the same part of the ship and each provided with the same basic diet of water gruel and sugar in the morning, mutton broth puddings and boiled biscuits at dinner, barley and raisins, rice, sago, and wine in the evenings, a diet conducive to scurvy. He divided the twelve men into pairs and supplemented their controlled diets. The first pair was given a quart of cider each day; the second, 25 drops of elixir of vitriol; the third, 2 spoonfuls of vinegar three

times a day; the fourth, half a pint of salt water; the fifth, an electuary of garlic, mustard, horseradish, balsam and gum myrrh; and the last pair was given two oranges and one lemon each day. "The result of all my experiments", wrote Lind, "was that oranges and lemons were the most effectual remedies for this distemper at sea."[65]

Lind recommended that lemons and oranges be carried on ships for treatment of scurvy. Realizing the difficulty of storing large stocks of fresh fruits, he suggested the use of 'rob'. This was a serious mistake because the boiling of the fruit to make 'rob' virtually destroyed the Vitamin C content.[66] This mistake is perhaps understandable considering Lind was a product of a pre-enlightenment era; he exhibited the scientific methods that were developed during the enlightenment but applied them inconsistently. In this case, he failed to experiment with the use of 'rob' before making his recommendations.

Apart from scurvy, Lind also observed the fevers and fluxes. In his studies of these he closely followed the work of Dr. Richard Mead (1673-1754) a leading member of the Royal College of Physicians and a doctor of prominent social standing. Like Mead, Lind clung to the idea that the diseases resulted from "three causes, the air, diseased persons, and goods transported from infected places". Mead qualified the first of the causes. "It is essential that infection is not received from the air itself, however predisposed, without the concurrence of something essential emitted from infected persons."[67]

In his role as a ship's surgeon and as a physician at Haslar, Lind had many opportunities of observing the properties of the fevers. From this he drew the conclusion that the hospital, jail, camp, and ship fevers

were all the same disease (that is, typhus, although Lind never used this term). This was one of the most frequent and devastating diseases, and Lind therefore devoted much effort to establishing its causes and providing cures. The fever, he observed, surfaced in areas where crowding, dirt, and semi-starvation existed. Like Mead, he attributed its spread to "effluvia, faeces, and above all contact with infected clothing" which carried the 'seeds of infection'. Unfortunately, he also followed Mead in rejecting the role of animals in the spread of disease. Mead had written: "Some authors have imagined infection to be performed by the means of insects, the eggs of which may be conveyed from place to place, and make the disease when they came to hatched. As this is supposition grounded upon no matter of observation, I think there is no need to have recourse to it." Lind, in An Essay on the Most Effectual Means of Preserving the Health of Seamen in the Royal Navy (1757), suggested fumigation of sick areas with brimstone, arsenic or gunpowder as one effective means of destroying the 'seeds of infection' but noted that under this method, lice were not destroyed adding "from which we might be led to imagine that contagion is not propagated by animalculae". The problem of the origin of typhus continued to elude him and "without the use of the microscope or of analytical chemistry, he [could] only conclude 'there are unquestionably certain limits prescribed to human researches beyond which, tho' fancy may take its flight, and theory make wide excursions, all is conjecture, obscurity, or profound darkness.'" [68]

Popular cures for fevers included blood-letting and the use of Dr. James' Powder, antimony and phosphate of lime. Lind rejected these in favour of peruvian bark (quinine), tartar emetic and opium. More

important than his cures, however, were his suggestions for preventing the spread of the fever. He challenged the logic of herding pressed men together. In the guardship, he noted the men remained in the rags in which they had been seized and if a few men suffering from the fever were introduced into healthy ships' companies there often followed widespread outbreaks of the disease. He suggested the establishment of 'slop ships' in which the "inspection, disinfection, and clothing (with 'slops') could be conducted on newly raised or pressed men prior to their distribution throughout the Navy" thus preventing infectious fevers from being carried into the ships. It was not until 1781, however, that the Navy saw fit to implement these suggestions. Lind had more immediate success in Haslar Hospital where he segregated the fever cases from other patients and required frequent changes of clothes and bedding.[69]

Another area where Lind made practical suggestions was in the procuring of fresh water supplies in unknown territories. He suggested that water should be obtained from natural springs or by digging a shallow well. If this were impossible or the water looked unwholesome, Lind recommended a simple filtering system consisting of two casks, the larger one with one end removed and the smaller one with both ends off. Each cask was to be partially filled with clean sand or gravel and then placed one inside the other. Questionable water would be poured into the smaller cask and when it filtered through the sand to the exterior larger cask it would be fit for consumption. This method of supplying water was inadequate, though, to provide for a whole company.[70]

Although most of Lind's reforms were logical and not impossible to implement, they went largely unheeded. The lack of action by the naval

authorities seems unjustified particularly as it resulted in the loss of thousands of lives. The torpor of administrative bodies has been cited as one reason for Lind's failure. At Haslar Hospital, for example, although Senior Physician, Lind was often prevented from bringing about effective change because the final decision in such matters was in the power of the Hospital's Council and the Board of the Sick and Wounded Sailors in London. Failure of agreement on their part retarded reform.[71]

A more complete explanation should encompass the context of the time in which Lind laboured. Conditions were not yet conducive to reform. The Admiralty had not orientated itself to the point of view that the lives of seamen should be a prime concern. With the American revolutionary war followed shortly thereafter by the French revolutionary wars the demand for seamen strained recruitment to the limit and beyond. Disease rates that could be accepted by civilian society and by the Navy in normal periods rapidly became unacceptable when the consequent drastic reductions in naval efficiency threatened national survival. In this changed circumstance, the institutional condition of the Navy greatly facilitated the study of disease. Finance was not limited, as it was in the private sector, by the need of short term gain and the authoritarian structure of the Navy "allowed much greater scope for comparative testing and experimenting under controlled conditions than in civilian medicine".[72] The emphasis of the Scottish enlightenment on progressive ideas and a new social concern helped to provide an environment conducive to medical reform. The advocates of reform were now increasingly to be found in positions that were more accessible to the higher authorities who had the power to institute change. Much

valuable ground work had been laid by Lind and the other early reformers but it was Blane and his generation, working in a more auspicious time, who were to make real progress in the implementation of reforms.[73]

FOOTNOTES

1) Sir Gilbert Blane, Observations on the Diseases Incident to Seamen (London, 1785), p.206.

2) Sir H.D. Rolleston, 'Sir Gilbert Blane, M.D., F.R.S.' in Royal Naval Medical Service Journal (Vol.I:ii, 1916), p.72; Sir Gilbert Blane, Elements of Medical Logick (London, 1819); Dictionary of National Biography Vol.II, commentary on Sir Gilbert Blane (1749-1834), p.664; Munk's Roll; The Roll of the Royal College of Physicians of London Vol.II, commentary on Sir Gilbert Blane, p.326.

It is pointed out by many authors that graduation from universities in the Faculty of Medicine, as in that of the Arts was the exception rather than the rule. D.B. Horn calculated that in the seven years down to 1783, there was an average of 400 students and in 1783-4 this figure increased to over 500. Only 22 students on average, however, took the only degree offered in medicine - that of the M.D. degree. Horn, pp.43-46.

3) The History of the Royal Medical Society (1737-1837), (Royal Medical Society Edinburgh, ?), Chapter IV, p.43.

4) Gilbert Blane, Address to the Medical Society of Students at Edinburgh (National Library of Medicine, 21 April 1775), pp.4-5.

5) Ibid., p.15

6) Ibid., pp.6,10.

7) Ibid., pp.12-13.

8) Blane, Medical Logick, p.1.

9) Bryson, p.53.

10) Blane, Medical Logick, pp.3-5.

11) Ibid., pp.6,7,15.

12) Sir Gilbert Blane, Observations on Diseases, p.215.

13) Peter Mathias, 'Swords and Ploughshares: the armed forces, medicine, and public health in the late eighteenth century' in J.M. Winter, ed., War and Economic Development (Cambridge, 1975), p.79.

14) Blane, Medical Logick, pp.9,16.

15) Sir Gilbert Blane, Observations on the Diseases Incident to Seamen (London, 1785), p.x.

16) Blane, Medical Logick, p.98.

17) Ibid., pp.104-105; Blane, Observations (1785), pp.ix, xii.

18) Ibid., pp.x-xi, xii.

19) Blane, Medical Logick, pp.106,189-190,191-192.

20) Ibid., pp.67-68.

22) Ibid., p.69.

23) Ibid., pp.74,75,77.

24) Ibid., pp.83-84,85,91,92.

25) Ibid., p.11.

26) Letter of T. Ismay, a medical student at Edinburgh University to his Father, describing his studies, 23 November 1771 (Edinburgh University Library), p.2; DNB - Cullen, p.280; DNB Vol.X, commentary on William Hunter (1718-1783), p.302; Rolleston, 'Blane', p.72.

27) Ibid., p.72; Blane, Medical Logick, p.74 with Blane's views also stated in Blane, Observations (1785), p.409.

28) R.S. Allison, Sea Diseases (London, 1943), p.171; Blane, Observations (1799), p.23; Blane, Observations (1785), p.85; Sir Gilbert Blane, Select Dissertations on Several Subjects of Medical Science

(London, 1822), p.363.

29) DNB - Blane, p.664; Rolleston, 'Blane', pp.72-73.

30) Sir Gilbert Blane, A Brief Statement of the Progressive Improvement of the Health of the Royal Navy (London, 1830), p.9.

31) Allison, pp.xv,xviii-xix,14.

32) Ibid., p.xx.

33) Ibid., pp.xxi,94; John Keevil, Medicine and the Navy 1200-1900 (Edinburgh, 1961), Vol.III, p.70.

34) Allison, p.52; A. Stenzel, The British Navy (London, 1898), p.206.

35) Allison, pp.xv,1.

36) Ibid., pp.2,5.

37) Blane, Observations (1785), p.292; Allison, p.63; Keevil, pp.81,182; Tobias Smollett, Roderick Random (London, 1927), p.53.

38) Allison, pp.63,64-65; Stenzel, pp.59,206; W.J. Simpson, 'Progress of Hygiene in the Navy and Its Effects on the Health of the Sailors' in Royal Naval Medical Service Journal (Vol.I:iii, 1915), p.302; Smollett, p.187.

39) Simpson, p.305; Allison, p.10.

40) Christopher Lloyd, The Nation and the Navy (London, 1961), p.130.

41) Allison, p.58.

42) Ibid., pp.10,58; Lloyd, p.131; David Hannay, A Short History of the Royal Navy 1689-1815 (London, 1909), p.94.

43) Allison, pp.58-59.

44) Ibid., pp.9,11,12-13.

45) Ibid., pp.13,53-54,56; Keevil, p.71; Hannay, pp.96-97.

46) Allison, pp.13,50,57; Keevil, p.71.

47) Allison, pp.53-54, 112.

48) Ibid., pp.11-12.

49) Ibid., pp.25-26,35; Hannay, pp.82-83.

50) Allison, pp.50,93; Hannay, pp.54,96-97.

51) Allison, 95-101; Lloyd, p.153.

52) Allison, pp.104-106.

53) Smollett, p.153.

54) Keevil, p.65 with Blane's words taken from his Statement of Comparative Health (1815).

55) J.J. Sutherland Shaw, 'The Hospital Ship, 1608-1740' in the Mariner's Mirror (Vol.22, 1936), pp.422-424; Allison, p.106; Keevil, p.67.

56) Allison, pp.109-112,150-153.

57) Keevil, pp.21,23-24,38; Allison, pp.113,126-127.

58) Keevil, p.20.

59) Allison, p.117; Keevil, pp.10,13.

60) Smollett, p.91.

61) Rear-Admiral H.G. Thusfield, ed., Five Naval Journals 1789-1817 (Navy Records Society, 1951), pp.44-49 with quote from p.49.

62) Keevil, pp.15,122-123.

63) Ibid., pp.38-39; Allison, pp.120-122; Sir H.D. Rolleston, 'James Lind, Pioneer of Naval Hygiene' in Royal Naval Medical Service Journal (London, 1915), Vol.1, p.185.

64) Rolleston, 'Lind', pp.181-182.

65) Keevil, p.42.

66) Ibid., pp.40,293; Simpson, p.303.

67) Keevil, pp.298,300-301 with quote from Lind's A Treatise on

the Scurvy.

68) Allison, pp.130-135,139; Keevil, p.302; Rolleston, 'Lind', pp.181-182,184,188.

69) Keevil, p.330.

70) Ibid., pp.330,335,336,337.

71) Ibid., pp.331,336; Rolleston, 'Lind', pp.181-182,188,189; Allison, pp.130-135.

72) Mathias, pp.75-76.

73) Allison, p.141; Rolleston, 'Lind', p.187; Blane, Observations (1785), pp.310-311.

CHAPTER THREE

> Surely there are no lives more valuable to the State, or have a better claim to its care, than those of British sailors, to whom this nation comparatively owes its riches, protection and liberties. [1]
>
> -Gilbert Blane

It was during the American War that Blane first made his presence felt in the Royal Navy. He joined Rodney on Christmas Eve 1779, as his fleet left for the West Indies via Gibraltar. The war between Great Britain and the Thirteen Colonies, supported after 1778 by France and Spain, had been growing in intensity when two incidents led to the intervention of yet another enemy - the Dutch Republic. A dispute over Britain's removal of enemy goods from a neutral Dutch ship and the encouragement that the city of Amsterdam was giving to the Americans led to a declaration of war by the Dutch Republic on Britain in 1780. The British Isles were not directly endangered by the coalition, but her interests elsewhere - Gilbraltar, Minorca, and America - were under a direct threat. After the fall of Yorktown on 5 September 1781, the empasis of the war shifted to Gilbraltar and the West Indies. Admiral Rodney's great victory over the French on 12 April 1782 largely decided the outcome of the war in the West Indies, but peace eluded Britain until 1783.[2]

The state of the Navy during the American War from a medical point of view was extremely poor and worsened after the war became general in 1778. Although the traditional view that the failure of Britain to maintain her Navy properly during this period must be placed on North's

ministry (when Sandwich was First Lord of the Admiralty) has been somewhat moderated, there were many problems with the subordinate boards that led to inferior conditions in the Navy. Until 1773, Hugh Palliser, Comptroller of the Navy, had ensured competent administration of the boards for victualling and stores. This was evident in the successful victualling of Captain Cook's voyages. Under Maurice Suckling, Nelson's uncle, conditions deteriorated. Sir Charles Middleton (later Lord Barham) assumed the post in 1778 and under him "Great improvements were made during the later part of his tenure of office; but it seems that stress of war did not permit him to reform fundamentally the unsatisfactory state of affairs he inherited from Suckling.".[3]

Poor victualling was aggravated by the Navy's rapid expansion during the war years. In the first stage (1774-1778) the problem was not immediately obvious as the American War initially only required an army to quell the uprisings of the colonists. The Navy did little more than provide transports and convoys. With the leap to a conflict of international proportions in 1778 in which Britain had no allies, the Navy increased in manpower. In 1776, 146 ships were in commission and 23,914 men on the payroll. By 1779, with 360 ships in commission, the naval roll had increased to 89,243. A peak of 107,446 was reached in 1783.[4] With this expansion came endless problems for the administration. The men required could only be found through impressment and they spread disease through the ships they were assigned to. This sorry state of affairs was combined with the general corruption and ignorance in the medical department, and in other departments, which meant the seamen suffered from the poor quality and insufficient quantities of medical supplies put on the ships.[5]

Arriving in the West Indies with a fleet of five ships, both Rodney and Blane were horrified at the condition of the sixteen ships already on that station. While Rodney was faced with the deplorable disciplinary state of the fleet, Blane confronted a medical situation equally shocking. In Observations on Diseases (1785) Blane wrote:

> We see, indeed, infinite pains taken to prevent cordage from rotting, and arms from rusting; but however precious these may be as the necessary resources of war, it will not be disputed that the lives of men are still more so, yet, though there is the additional inducement of humanity to watch over the health of men, I do not think that this, in general, is studied with a degree of attention equal to what is bestowed on some inanimate objects. [6]

Blane's records show that prior to his arrival with Rodney there was an annual mortality rate among the seamen of one in seven, attributable not to the prevalence of the local disease, the Yellow fever, but more so to other diseases, particularly the sea diseases.[7]

> I found that in a fleet, of which the complement of men was 12,109, the mortality in one year amounted to 1,518, besides 350 rendered unserviceable, a number more than equal to the equipment of three ships of the line. [8]

Blane was not prepared to accept the situation.

> Having been appointed by Lord Rodney Physician to the Fleet under his command, in the beginning of the year 1780, I determined to avail myself, to the utmost of my abilities, of the advantages which this field of observation afforded. This I was led to do, in order to satisfy my own mind as a matter of duty, as well as to find out, if possible, the means of bettering the condition of a class of men, who are the bulwark of the state, but whose lot is hardship and disease, above that of all others. [my italics] 9

In pursuit of this goal he sought "to enlighten the commanding officers ... regarding the most effectual means of maintaining the health and vigour of the men, of preventing the invasion of disease, and of doing

justice to the sick".[10] He also petitioned the higher naval authorities because he believed it important that "those who direct the Navy, either in a civil or military capacity, should be aware of the causes of sickness and mortality, in order to guard against them as far as is practicable".[11]

In reference to the appalling mortality rates Blane observed that,

> When this is duly weighed by a considerate mind, as it affects the most important interests of the state, together with the great difficulty and expense of replacing these valuable subjects by fresh recruits, and when the calamitous sufferings of the individuals themselves are brought home to our feelings, no case could be more calculated to awaken sentiments of patriotism and humanity. [12]

Not only would reform "be an object of humanity", but it would result in great economy. "The expense of replacing those who die, and of supporting hospitals, may with truth be stated at much more than a hundred times what the supply of fruit and other refreshments would cost."[13] Blane was careful to cloak his reforms with the financial benefits that would result and it was this that was to make them so appealing to the Admiralty. As Blane later wrote: "One would almost believe that the saving of money was to be held more worthy of attention than the saving of lives; the true statement of the case being that there is a great saving of both lives and money."[14]

By appointing him Physician to the Fleet, Rodney ensured that Blane's influence would be felt by all the surgeons and captains under the former's command. On Blane's advice, each surgeon in the fleet was required to submit to him, monthly returns "stating the degree of prevalence of different diseases, the mortality, and whatever else related to the health of the respective ships". These reports were originally intended to help regulate

the hospital ship and to provide information for Rodney concerning the health of his fleet. As the latter seldom had less than twenty and often more than forty ships of the line, the monthly statements he received allowed Blane a unique opportunity to gather evidence and make astute observations which he used to support reform.[15] In a letter to the Board of Sick and Wounded Seamen in 1780, he used this evidence to support his demands for improved standards.[16]

It was at the end of May 1780, during a period of operations, that Blane began collecting records of the sick and wounded. Of his initial attempts at record keeping Blane noted, critically, that he had made a grave error in failing to make a distinction between "the killed and those who died of disease".[17] The following table,[18] taken from the 1785 edition of Blane's Observations on Disease, shows how important this distinction was:

Died of Disease	3,200
Killed in Battle	648
Died of Wounds	500
Total	4,348

The number of men who died from battle or wounds received are shown to be almost insignificant in comparison to those who died of disease.

In August 1780, Blane wrote a treatise, A Short Account of the Most Effectual Means of Preserving the Health of Seamen, which he had printed and distributed at his own expense, to provide the officers of the West Indies with general guidelines for the prevention of sea diseases. In this treatise he stated that "the only very fatal diseases incident to seamen are Fevers, Fluxes, and the Scurvy". In the prevention of scurvy he suggested taking precautions in diet, particularly concerning the

provision of fresh fruit and vegetables and the supply of wine. For the fevers and fluxes, he discussed how these could be prevented by attention being paid to the general rules of cleanliness, dryness, the smoking and airing of ships and to the specific instructions for the individual diseases. He stressed that "when a fever is very prevalent in a ship, it is almost always infectious, and this infection must either have been visibly introduced from without, by the persons or clothes of men, or it has arisen from causes existing within the ship herself. The means of prevention should have regard to both these".[19]

In this as in all his writings, Blane's major concern was to determine trends based on his own experiences and observations and to suggest possible reforms. Utility was his objective "rather than the praise of originality" so he did not confine himself to his experiences alone. He reviewed the conclusions of others, such as Dr. Lind and Captain Cook, through writings or conversations but he was prepared to assume nothing "from mere report or testimony", preferring to verify or disprove the assertions of others through his own observations.[20]

In the 1780s, prior to the establishment of a central medical authority in the Navy, individual physicians implemented medical regulations in the fleets under the authority of the admiral of the fleet.[21] Rodney's unwavering support was therefore indispensible to the implementation of Blane's medical reforms. Rodney was intolerant and uncompromising of those who were derelict or delinquent in their duties, standing over his officers with a rod, and dealing out criticism unsparingly, avowing it as his personal principle of action to rule in such a manner. The element of pity never entered into his censures, but

then they were neither excessive nor undeserved for he incorporated a sense of expediency and of justice in his measures. Concerned for the welfare of his men both for their own sake and because it bore a direct relationship to the performance of his fleet, which few commanders of the day seem to have understood, Rodney agreed to try Blane's suggestions in the West Indies Fleet.[22]

In September 1781, when Admiral Rodney was forced to return to England for medical reasons, Blane, as his personal physician, accompanied him and made use of the journey to London to gain admittance as a Licentiate of the Royal College of Physicians of London. More important to the well-being of the Navy, he also used the opportunity to present to the Board of Admiralty a memorial detailing the neglect and the sickness he had witnessed in the Navy. He hoped by presenting this Memorial to convince the Admiralty of the advantages to be had in employing reforms. The advantages included the ability of the country to maintain the Navy in "a state of efficient duty [with] an incalculable diminution of the requisite number of seamen, of the amount of tonnage and of the necessary expenditure of treasure in the present day, and in the future".[23] In his Brief Statement of the Prgressive Improvement of the Royal Navy (1830), Blane listed the seven points in need of attention for the prevention of disease that he had raised with the Board:

1) "A neglect of cleanliness, ventilation, and dryness in the interior economy of ships", including the men, their kit and bedding, and the ship as a whole;
2) The lack of a supply of lemon and lime juice to prevent the most destructive scourge among ships - scurvy;
3) Abuse of alcohol. Blane recommended substituting wine for rum and grog;
4) A lack of "adequate nourishment and comfort for the

use of the sick and convalescent who remained on board their own ships";

5) The lack of "proper bedding and of soap". Blane argued that if these articles were provided along with a suitable diet, then "the means might be afforded of curing men on board of their own ships, the hopitals on that station being too small, ill arranged, and extremely expensive", and the men who went ashore ran the risk of contracting the diseases of the climate;
6) The lack of "a gratuitous supply of medicines, as well as necessaries to the surgeons, in order to enable them to cure as many as possible without sending them to hospitals". One medicine he particularly advocated was Peruvian bark sent from England in a fresh state.
7) A suggestion to provide regulations to ensure separation, ventilation, and cleanliness for hospitals and hospital ships. [24]

This attempt to persuade the authorities of the need for change was only the first of a continuing effort, for he rightly observed that the means of prevention of disease,

> are not so much in the province of the medical profession, as of those who are entrusted with the direction of the Navy in a civil or military capacity; and that with regard to cure and recovery also, a great deal depends upon them, by their having in their power to make a suitable provision of proper diet and cordials. [25]

Many of his recommendations were to go unheeded for many years but Blane remained optimistic.

> Though all the recommendations ... were not at first complied with in their full extent, enough was done to evince their expediency, and to lead to great future improvements. I had the immediate and high gratification of succeeding in the recommendation of wine, and of being eye-witness of its almost incredible benefit in the new reinforcements which accompanied the Admiral on his return. [26]

Proposals for change not immediately acted upon were not filed away by Blane. Through his perseverence, continued research, and the help of Rodney, he continued to implement reforms in the fleet of the

West Indies. So changed was the condition of the fleet in the later part of Rodney's command that he wrote, "To his [Blane's] knowledge and attention it was owing that the English fleet was, notwithstanding their excessive fatigue and constant service, in a condition always to attack and defeat the public enemy. In my own ship, the Formidable, out of 900 men, not one was buried in six months."[27]

A major obstacle Blane faced was the absence of clear definitions of the diseases, their symptoms and possible cures. This caused confusion among professionals when they tried to compare data they had collected, a confusion that translated into numerous and needless deaths.[28] For example scurvy was loosely defined as to include everything from beri-beri (caused by a Vitamin B - thiamine - deficiency), to pellagra (lack of nicotinic acid forming part of the Vitamin B complex), to scurvy. Blane observed that,

> The term Scurvy, in the English language, and scorbutus in the general medical language of Europe, has been employed to denote, both cutaneous eruptions, and that disease which is caused most commonly by a long use of salt provisions, and principally known by its appearance in ships which have been long at sea. By having this name in common, these two diseases, though widely different, may ... have been considered identical, and treated as such. ... The consequence of this strange jumble was, that a vague, inefficient, and inconsistent practice ... was adopted. And it seems to have been chiefly to the want of the clear conception of the diagnosis, and peculiar nature of the sea scurvy, that a simple, infallible, and easily procurable remedy for it, was long neglected, to the incalculable detriment of humanity and the public service. [29]

Blane was aware as well of similar confusion with the fevers and fluxes that engendered "errors of the most fatal practical tendency". Throughout his career, Blane endeavoured, in his records and statistics, to distinguish carefully among the sea diseases.

In response to the confused atmosphere that had developed prior to his time, Blane provided in Observations on Diseases (1799) the specific symptoms he had isolated to indicate scurvy:

1) Sore gums that bled to the touch.
2) Livid blotches or weals on the fleshy part of the legs; under which hard caky substances could be felt.
3) Depression of spirits.

An important point he noted was that "appetite for food is in general unimpairedin every stage of the disease".[30] In detailing the causes of this disease he firmly stated that it was the diet of a sailor while at sea and the length of time spent at sea, more than anything else that caused scurvy. "The principal source of scurvy is a vitiated diet consisting in salted animal food." Elsewhere he wrote of the scurvy that it was due to "a defect of nourishment ... that it was not infectious and that land air by itself had no effect, but that it was the concomitant diet which mattered".[31] He went on to add that the unnatural life full of hardship of sailors, in concurrence with the unnatural diet, resulted in accelerated cases of scurvy. These hardships included "a scarcity or bad quality of water, a cold moist air, either from climate or from the manner in which a ship is kept; bad clothing, damp and dirty bedding; or foul apartments and crouding", and elsewhere "dejection of mind" due to the sameness of each day experienced at sea. He noted that "hard labour has been assigned by some as a cause; but this is not conformable to my observation". Yet, even "under all these disadvantages, ... the scurvy would not have arisen, had fresh vegetables been used".[32]

Blane was aware that precise definition was not sufficient to ensure the expeditious implementation of 'easily procurable remedies'.

He noted, wryly, "the curious perversity or aversion in mankind to innovation" that led in the case of scurvy to the loss of thousands of lives in the seventeenth and early eighteenth centuries despite the known virtues of the juice of citric fruits.[33]

> It is ... a curious fact, though mortifying to human wisdom, and to our national sagacity, that the virtues of this remedy were equally known in the beginning of last century as they are at this moment; yet it has never till now attracted the attention either of medical men or of sea officers, to the degree it ought; insomuch that it had, in great measure, fallen into neglect, when the knowledge of it was revived ... by the writings of the late Dr. James Lind. [34]

He suggested that the slowness with which the use of lemon juice made "its way in the world as a popular and established fact ... may be owing partly to this circumstance, that society in general not being obnoxious to the sea scurvy ... the cure of it is not a matter so generally interesting; [and] partly perhaps to this, that ... the ... remedy is a simple production of nature, not promising any extraordinary medical virtues".[35]

The above passage shows Blane's sincere desire to give credit where it was due. Nevertheless, although it was Lind who first sponsored the benefits of fruit and vegetable as a cure and a preventative of scurvy, it was Blane who succeeded in having the remedy officially adopted. Blane made his suggestions more boldly, and had Admiral Rodney's full support behind them. Fortunately, Blane also laid more emphasis on fresh fruit juice than Lind had done.[36]

In the interval between Lind's and Blane's efforts at reform there were several remedies in use for curing scurvy. Sour Kraut, Elixir of Vitriol, Malt and Essence of Wort, and Vinegar were the most popular.

For each remedy there were groups of supporters. Lind, for example, stymied in his effort to have fruit juice adopted, supported the use of Sour Kraut over the other available choices whereas Dr. Huxham supported Elixir of Vitriol and Dr.'s Pringle and MacBride, Malt and Essence of Wort. This latter cure was so well reported, if inaccurately, that it consequently became a regular issue. The use of 'rob', meanwhile, fell into disrepute. Captain Cook had discovered that it was of virtually no value and his poor opinion of it ensured a decline in any popularity it may have enjoyed.[37] Blane, himself, had nothing positive to say about the antiscorbutic value of 'rob' and expressed great surprise that Captain Cook's ship in the voyage of discovery to the southern hemisphere, in the years 1773 and 1774, had been furnished with the rob of lemons and oranges which "has not been found to possess the same virtue as the juice". [38] For Blane, "Vegetables in the form of sallads are more powerful than when prepared by fire; and I know for certain, that the rob of lemon and oranges is not to be compared to the fresh fruit."[39] He noted of Cook's journey:

> The chief cause to which he [Cook] ascribed the great health of his men in that voyage and which are so eloquently commented on by Sir John Pringle, were the use of malt, sour kraut, and potable soup, together with the extraordinary attention to cleanliness and ventilation. It may here be alleged that the scurvy was in this instance prevented without the use of this vaunted specific [ie. lemon juice]. But it appears from the narrative, that Captain Cook was only fifteen weeks and three days on the longest cruise in search of a southern continent, which is not sufficient time to prove thoroughly the efficacy of his methods, and far short of the time for which ships have kept the sea exempt from this disease, by the virtue of lemon juice alone, under circumstances which all other means have failed. [40]

Not prepared to stake all on one cure, Blane worked, while in the

West Indies, to supplement the regular seaman's diet of biscuit and pease with a variety of fresh vegetables in addition to citric fruits. Fresh potatoes were introduced, barley was occasionally substituted for some of the oatmeal, "melasses and sour kraut" were provided and lemons and oranges distributed. Evidence of the efficacy of his treatment come in June 1781 when Blane, faced with 1600 seamen of the fleet who arrived at Barbadoes with scurvy, prescribed a diet of fruit and vegetables. Within four weeks he saw remarkable recoveries and improvements which he attributed to the diet, aided by a clean environment and recreation.[41]

In other areas Blane also wrought changes beneficial to the seamen. The problem of ensuring an adequate supply of drinkable water had remained unsolved. Water kept in wooden vessels was "considered as more or less liable to putrefaction". Blane's remedy was to infuse the water in the casks with quick lime. This kept the water 'sweet' by killing off algae and insects and it did not seem injurious to health. More to the point, cheap and relatively easy to procure. Blane believed that other recommended substances such as vinegar and cream of tartar were less effective than quick lime.[42]

As Lind had shown clean water could be obtained by filtering muddy or offensive water, but Blane had to reject this system as being too slow for convenience. In its place he suggested a more efficient apparatus created by filling

> the narrow mouth of a large funnel ... with a bit of sponge, over which let there be a layer of clean gravel or sand covered with a piece of flannel and over the whole, another layer of sand. Muddy or offensive water being poured upon this, runs or drops out clear; and care must be taken to change the sand, sponge, & c. frequently as they will become loaded with the impurities of the water. [43]

Although Blane made headway in the battle of scurvy in the fleet under Rodney, elsewhere in the Navy the problem continued to exist because the Board of Admiralty refused to acknowledge the essential value of fruit over other cures. As Blane said in his Observations on Disease (1799), "It may be here worthwhile to relate in what manner the general introduction of lemon juice into the Navy was effected." Blane had been conducting investigations into the value of lemon juice for over a decade when in 1793, he was given the opportunity to test his theory beyond a doubt. In this year Rear-Admiral Sir Alan Gardner, one of the lords of the Admiralty, was nominated to the command of a large squadron bound for the East Indies and he sought after Blane (who was then in the prestigious position as Physician at St. Thomas Hospital) for medical advice for his squadron. Blane strongly recommended, among other matters, that Gardner carry a large supply of lemon juice to be administered under the eyes of the officer of the watch. Gardner applied for and received the lemon juice but before he could leave he was replaced by Rear-Admiral Rainier who then directed a smaller force out to the East Indies. As a result of the change in numbers of seamen, Rainier had more than an adequate supply of lemon juice for all crew members on board the 74-gun flagship, the Suffolk.

> This proved a voyage of nineteen weeks without touching at any port, and without any supply of fresh provisions; yet upon the arrival of the Suffolk at Madras, there were only fifteen upon the sick list, none of whom were affected with scurvy. In consequence of this report, ... the general supply mentioned above was ordered. [44]

The success of this experiment enabled Blane in 1795, now a Commissioner to the Board of Sick and Wounded Seamen, to persuade the Admiralty under the administration of Earl Spencer, to sanction the issue of fruit and

fruit juice on a more generous scale together with more variety in the seamen's diet. It was not until 1799, however, that this general issue became a regular feature of all stations, both home and abroad. In 1796, after the outbreak of war with Spain, the Board was forced for a time to limit the supply in remote stations to those ships on particular services and to individuals who showed signs of suffering from scurvy.[45]

Much has been made of Blane's efforts to combat scurvy but his interests encompassed more than this one disease. He strove as well to make headway in the fight against the fevers and fluxes. By the late eighteenth century he believed the fevers to "have been a more grievous and general source of sickness and mortality in the Navy, than even the scurvy", while the fluxes stood third in line.[46] In his effort to reform, he necessarily touched on such areas as infection, personal cleanliness, a ship's cleanliness, the problems of impressment, and the problems of victualling.

In his writings about the fevers and fluxes, Blane was again concerned to distinguish clearly among the diseases. He wrote of the fevers in Observations on Disease (1799), that those "which occur most frequently on board of ships, and at naval hospitals belonging to the fleet in which I was employed were the infectious ship fever (which is the same with the jail and hospital fever or typhus), the bilious remitting fever [enteric or typhoid fever and malaria] and the malignant yellow fever".[47]

Having identified the fevers Blane then identified the conditions in which they arose and their symptoms in an effort to diminish the chance of confusion. The ship fever, which he noted tended to occur more frequently in temperate and cold climates but was also found in the West Indies, was

an infection that found its origins in accumulated filth and a lack of ventilation "generated by the breath and perspiration of men, crowded for a length of time in confined air, and without means of personal cleanliness, particularly from the want of shifts of linen".[48] The most consistent symptom of the disease was "a greater degree of muscular debility than what takes place in other fevers". This was accompanied by a steady, unrelenting delirium in which "Sensation and reason are here in a state of uncommonly deprivation ... called coma". Two other symptoms were "a particular heat in the skin, communicated to the hand of another person" while taking the patient's pulse, and a "more copious secretion of bile, which, when thrown up, is generally green". A final symptom was the appearance of spots which was a sign that the patient was in considerable danger.[49]

In contrast to ship fever, Blane described the bilious remitting fever as being "peculiar to tropical climates" and rarely occurring at sea unless the individual had previously been exposed to it via the air of marshes and woods while on land duty. The symptoms were more violent than in the ship fever and marked by a tendency towards periods of remission throughout the course of the disease. It was further distinguished by more copious secretion of bile and "by the bilious vomit and stools, more violent delirium, and head-ach, and by being attended with less debility". There was also "in some cases a yellowness of the eye, and even of the whole skin, but without the other symptoms that characterise the yellow fever, properly so called".[50]

Of the Yellow fever Blane stated that, though peculiar to hot climates, its origin was unknown. He therefore attributed it to fatigue from the

sun and intemperance among newly arrived Europeans in the West Indies. Its symptoms included hot and cold flushes, "followed immediately by a violent head-ach, pain in the back, universal debility, sickness, and great anguish proceeding chiefly from great pain and distress at the stomach, and in a few hours a yellow color in the face, soon after in the eye, and it extends more or less over the whole skin".[51]

Fluxes, according to Blane, seemed to "arise in the same circumstances, and to be owing to the same general causes as the fevers". As Blane pointed out in Short Account (1780), "foul air and uncleanliness, ... excessive fatigue, too much exposure to heat, cold and wet, scanty or unwholesome food, bad water, and intoxication" contributed to awakening 'the seeds of disease'; "whatever weakens and exhausts the body, renders it also more susceptible of noxious impressions".[52] While they arose out of similar conditions, however, dysentery was "most apt to occur in the convalescent state of fevers or in men labouring under the scurvy", as shown by the appearance of dysentery on ships which had been subject to fevers. Also, Blane noted that in similar conditions several factors determined whether fever or dysentery would arise. One factor was "a difference in the constitutions of different men". Another was "the nature of the occasional cause. A dysentery, for instance, is more likely to arise from an irregularity in eating or drinking; a fever from being more exposed to the weather, particularly marsh effluvia." Yet another factor was the different habits of life which existed among crews. The symptoms of dysentery included, primarily, "a determination to the bowels" with similarities of additional symptoms to those of the fevers but without the presence of any coma, headache or delirium.[53]

Aboard ship, Blane advocated general rules of cleanliness, dryness, smoking and airing to prevent these diseases. He also believed that as a company of men became accustomed to one another and their location that their state of health would stabilize and improve. To protect both newcomers and those already on a station, he suggested, therefore, that attention be paid to men "upon their first coming to this climate, that they be exposed as little as possible to sudden changes of heat and cold, or to hard labour" with special attention paid to their diet, recommending a fresh fruit and vegetable diet from the first.[54] By so doing, he hoped that they and the other seamen would remain unaffected by fresh outbreaks of disease.

While Blane was not as much an expert on fevers and fluxes as Lind, he nevertheless did much by endeavouring to clarify the differences among the fevers and fluxes and by reducing the incidence of these diseases in the Navy. As far as cures were concerned, he had little to add to Lind's recommendations. For typhus fever, he simply reiterated Lind's warning against the popular cure of blood-letting. For both the bilious remitting fever and the yellow fever, he was equally hard pressed to suggest new cures. He did allow limited blood-letting and the use of peruvian bark in the bilious remitting fever but cautioned that in the initial stages the two diseases were difficult to distinguish because of the occurrence of black vomit and yellow colour present in both diseases.[55] One common treatment for the fluxes was the use of opium. Blane's opinion of this was that it could be used with some success but he cautioned all practitioners to take care in using opium at any stage of the disease but particularly in the beginning "for though it is an

excellent remedy when seasonably and judiciously employed, it is very liable to abuse, particularly in the hands of the unexperienced who may be tempted to give it improperly from an anxiety to relieve".[56]

As noted earlier, Blane recognized the difficulty of developing cures and found it more expedient to work to prevent disease by attacking the general, observable conditions in which it arose. He devoted his time to pressing for reforms leading to cleanliness, ventilation and a reduction of overcrowding; on board ship, the lack of ventilation combined with overcrowding, and an atmosphere of pervasive filth, conspired "in producing morbid effluvia".[57] Blane's greatest concern was for cleanliness because, while a lack of ventilation and overcrowding could aggravate the occurrence of disease, he noted that in any situation, either on land or sea, filth alone could produce the same effect "for there is the peculiar fact belonging to infection about the persons of common beggars, and others who do not change their linen for a great length of time, though living in the open air as much as other people".[58]

Blane recognized that on the smaller ships, the frigates, there was more cleanliness and less sickness than was seen on the larger ships. He gave the following explanation:

> There is less chance of mixtures of men in frigates, as their complement is smaller; it is more easy for the captain and officers to keep an eye over a few men than a great number; for, in a great ship, there are generally men, who concealing themselves in the most retired parts, no one takes cognizance of them, and they destroy themselves, and infect others, by their laziness and filth. In the next place, there is a great proportion of volunteers and real seamen in frigates, and more landmen and pressed men in ships of the line, the former being more in request, on account of greater prize-money. Lastly, a

> small ship is more easily ventilated, and the mass of foul air issuing from the hold, from the victuals, water, and other stores, as well as the effluvia exhaling from men's bodies, is less than in a large ship. [59]

It was reckoned by Blane, that to improve the state of personal cleanliness among seamen and the overall cleanliness of the ships would require much effort from all levels of the Navy. He therefore addressed the problem to crews, officers, and the administrative staff. One suggestion he had was to supply men with soap. This was not so impressive in itself but Blane suggested that the cost be charged against the men's wages. He was perfectly aware that the Government would be reluctant to bear such a financial burden. "But," he noted, "were it supplied at the expense of the state, it would be an inadequate statement and a narrow view of its benefits to say, that there would be a tenfold pecuniary saving in the tear and wear of men." Blane's suggestion of docking the cost from the men's wages was put into practice in Rodney's fleet and in some other fleets but general issue of soap did not occur until 1810.[60]

Apart from personal cleanliness, a clean ship was also considered imperative to maintaining the health of the men on board. Sweeping, washing, and scrubbing the decks were the primary means of keeping the ship clean but while Blane, like Lind, encouraged these practices he was adamant that the end result be a dry as well as a clean ship for dampness was a hindrance to good health. "Moisture, whether adhering to clothes, to the sides and decks of ships, or floating in the air, is pernicious to health, and ... one of the principal means of preserving health consists in obviating it." Elsewhere he wrote, "Dryness is perhaps of as great consequence as any one thing that can be named, for not only the complaints

commonly called colds are more owing to wet than cold, but moisture is the means of producing, or at least, exciting dangerous fevers."[61]

The desire for dryness, tended at times to restrict washing.

> The decks should not be washed so often when the weather is moist as when it is fine, as it will be more difficult to dry them, and more harm may arise from the moisture than benefit from the cleanliness; and in climates and seasons where the weather is both wet and cold, it would be most adviseable to omit washing altogether and to depend upon scraping and sweeping.

In an attempt to deal with the problem of dampness due to washing, Blane suggested an alternative method, first proposed by Lind, of scrubbing the decks with sand heated in the oven. This came into use towards the end of the eighteenth century while Blane was still active in reforms.[62]

One area of the ship that was particularly difficult to keep clean and well ventilated was the area under water - the orlop and hold - which, due to neglect, was inclined to become "a receptacle of nastiness" and "emit an offensive vapour ... particularly so from the materials they contain, [ballast, food, stores, water] and from the want of access to fresh air".[63] To reduce the filth that accumulated at the bottom of the ship, Blane suggested a different material for the ballast. "That which is called shingle, consisting all of pebbles, is far preferrable to that which is sandy and earthy, as it does not so readily soak and retain the moisture and filth. Water or fluid of any kind readily subsides in it, and should any putrid matter be entangled in it, there will be less difficulty in washing it out."[64] By 1815, Blane proudly pointed to another ballast that was being used and which was even more effective in removing filth. It consisted of "small masses or pigs of iron" with the requisite steadiness of a ship achieved by the weight of iron tanks, each

capable of holding two tons of water, which were placed over the iron ballast, replacing the lower tier of wooden water casks. Apart from the advantages to cleanliness, the use of iron tanks filled with water meant that a ship's water was no longer exposed to the problems associated with wooden casks.[65]

The problem of ventilation was dealt with by the use of ventilators and windsails to funnel air from above to the lower decks. Writing in 1815, Blane commented on how the design and use of ventilators had progressed. Windsails formed by "wide tubes made of canvas, and extended by hoops into the form of a cylinder ... through the hatches" had had to be abandoned because they could not be used in rough weather. They were also considered detrimental to health because they allowed blasts of cold air into the spaces where the men slept. Subsequently, brass tubes "running from the hold or lower deck and terminating in the open air", had been used, but by 1815 all the Navy's ships had been fitted out with a funnel placed vertically "near the middle line of the ship before the fore-mast, leading through the forecastle deck". On this deck "there is neither hatchway nor ladder, and the sleeping places are under it". The use of ventilators complemented an order which stated that ports were to be kept open whenever possible. To further assist in airing out the decks, hammocks and bedding were removed to the fresh air where they were to be aired. This, Blane considered, was of particular concern after the ports had been closed for any length of time.[66]

The most efficient method of raising the number of seamen in the Navy was still by means of impressment. Lind and Blane correctly pointed to this practice as the "principal means both of generating and spreading

the seeds of disease". Blane further noted that the same problems were evident in men received from the jails or as prisoners of war. He realized that because impressment was the most efficient means of recruiting men for the Navy it could not simply be abandoned. The evils of the practice could, however, be mitigated if all new recruits were stripped and washed, their hair cut and all their clothes destroyed, and they were provided with a fresh set of clothing. Completed before a man joined a ship's company, such measures would reduce the chance of newcomers bringing in diseases and the chance of diseases spreading throughout the ship they eventually joined.[67]

The clothing of seamen was a particular problem in this period. Clothing, usually consisting of trousers rolled up to the knee, a loose fitting shirt and generally no covering for the feet, was worn until it hung on their bodies in tatters. The introduction of slop ships in 1781, while Blane was still Physician to Rodney's fleet, helped to alleviate the problem. 'Slops' were made available through the purser to destitute seamen when they came aboard ship, and the cost was deducted from their pay. This arrangement was far from satisfactory. Under Lind's efforts, in 1757, the Admiralty had agreed to provide hospital uniforms with their prime interest to prevent desertion, but a common naval uniform did not appear. This the Admiralty considered too costly an undertaking when the majority of the seamen were only in the Navy for the duration of the war. Blane carried on with Lind's effort and attempted to make the idea appealing to the authorities. He pointed out that, first, the individual would have adequate protection from "the impurities of the air"; second, the uniform would remain on the seamen if the officers

knew what clothes each individual was to possess; third, as a result of regular inspections, the seamen would be less likely to sell his uniform for money without being caught out; and fourth, that desertion would become more difficult. Blane's primary interest in the issuance of uniforms was to reduce the incidence of disease by not allowing dirty and infected clothing on board the ships. He was also concerned by the lack of protection afforded to the seamen by 'slops', particularly of their lower extremities. Prone to scrapes and cuts, seamen suffered greatly from infection and ulceration. Unfortunately, clothing was not generally regulated until the issue of a uniform in the 1840s.[68]

Since both bedding and clothing were regarded by Blane as sources of disease, he recommended that caution be used in handling the bedding and clothing of a man who died from fever, flux or small pox. He suggested that the best action was to throw these articles overboard along with the body. If a man survived these illnesses, precautions were still necessary to prevent the spread of the infection. Bedding and clothing were to be smoked and then washed before the man rejoined his mess. If he were sent to hospital, these items were to accompany him while all other items left behind, his hammock and utensils, were to be smoked and washed before used elsewhere. The berth the individual had occupied was to be washed, smoked, dried by fire, and then sprinkled with hot vinegar and white washed with quick lime. Blane assigned responsibility for overseeing these procedures to the ship's officers whose duties were to ensure that cleanliness and discipline were maintained for the benefit of the seaman's health. The commanding officers more than the medical officers were to have the duty "of an unremitting vigilance with regard to all those

regulations as points of discipline, ... by which the generation and the spreading of infection are counteracted" since they were in a better position to command the respect of the seamen.[69]

Having examined the major reforms that Blane strove to have implemented in the Royal Navy, there remains the task of evaluating how successful he was. Blane played a major role in the eradication of scurvy in the Navy but his efforts were initially confined to specific fleets whose commanders heeded his advice. Rodney was one such commander. Another was Admiral Pigot who was at New York in September 1782 when Blane was there. "Admiral Pigot's great zeal for the good of the service, as well as his natural humanity, induced him to listen to whatever was proposed for the benefit of his men." Blane's continued efforts culminated, during his tenure on the Board of Sick and Wounded Seamen, when the disease was "prevented, subdued, and totally rooted out, by a general use of lemon juice, supplied for the first time at the public expense in the year 1795"; within two years of its general issue, scurvy was extinct.[70]

Blane saw similar progress in the treatment of fevers and fluxes during his duties in the West Indies, although success was not as complete as with the scurvy. The primary reason for the more limited success was lack of knowledge concerning the exact causes of these diseases. Blane had theories such as, for example, the link between filth and ship's fever, but he was well aware of the deficiency in his own knowledge and that of other medical men. As early as 1785, he recognized this limitation. He wrote that "In some instances, reasons can be assigned for the prevalence of particular diseases, in particular ships, such as accidental infection, or the manner in which they have been victualled,

manned, or disciplined, but in many cases, the cause eludes our inquiry."[71] The success he did experience he attributed to the careful attention paid by officers and, consequently crews to "cleanliness, ventilation, dryness, sobriety, the separation of those in health from those affected with contagious fevers, and by a more general and deep impression on the minds of commanding officers, that one of their most sacred and indispensable duties consists in enforcing the means of preserving health".[72] The progress in combatting disease during Blane's time as Physician to the Fleet is evident in the difference of mortality rates from the moment he arrived in the West Indies until his return to England. Initially, the death rate had been one in seven men but in his second memorial of July 1782, this rate had been reduced to one in twenty.[73]

On top of all the physical changes that were made to discourage the spread of disease, Blane noted that the psychological attitude of officers and seamen played a critical role in determining how effective the physical changes would be in preventing and arresting disease.

> The moral effect of all [these physical changes] ought not to be overlooked. The encouragement administered to men's minds by kind treatment, and the anxious desire of officers to supply all their wants in sickness and in health, while they prove an inducement for good men to enter the service, cannot fail to add to that alacrity and spirit so favourable to health. [74]

One consequence of the reduction in the number of cases of sickness and death, Blane was proud to point out, was that there was no longer a need to overman the ships. This, in conjunction with improved medical standards on the ships, meant that the number of men pressed for service declined and those who were pressed were now housed in "circumstances

less conducive to the engendering and diffusion of infection".[75] Yet, though Blane felt that much progress had been made in the period since he joined the Navy, he realized that there was still much more to be done to reduce disease among the crews and after leaving the Navy in 1783, he continued to press the Admiralty to make his reforms universal within the Navy.

By 1830, in A Brief Statement, Blane was able to write of the changes that had occurred,

> It is ... highly satisfactory to contemplate the many proofs of the substantial benefits that have been accrued to the sea service in the last fifty years ... in all quarters of the world, from the zeal, humanity, and good judgement, displayed in promoting the health of seamen. It has been proved that it has given double efficacy to the national force, and therefore subtracted in the same proportion from the national expenditure. [76]

Blane did not regard himself as wholly responsible for these changes in the Navy and it would be inaccurate to suggest that he was. He did, however, in the years following 1783 continue to contribute much to the cause of educating people to the problems that existed and the need for improved conditions. In particular, when he became a Commissioner on the Board of Sick and Wounded Seamen (1795-1802), he was in a position to ensure that his reforms became regularized throughout the Navy.[77] In 1795, for instance, he pushed through legislation on the general issue of lemon juice and in 1796 he persuaded Admiral Lord St. Vincent to apply for soap for his crews from the Board of Admiralty, either on a gratuitous basis or by deducting the cost from the seamen's pay. A general order was subsequently issued for the supply of soap on the latter basis.[78]

Apart from the fight against disease, Blane did much to improve

the position of the Navy's medical officers. Surgeons, until the late seventeen hundreds, had little social standing within the ranks of the Navy, and consequently their efforts were seldom regarded in a serious light. As early as his stint in the West Indies, Blane recognized the potential value of the surgeons. He argued that if these men were given encouragement and position within the Navy then they would take more pride in, and devote more effort to, their work. Surgeons attracted to the Navy would also be of a class of more liberal education and sentiments who would have more desire to work for better results. In 1796 his suggestion, made as early as 1781 of supplying medicine to the surgeons, was partially realized when at the urging of the Sick and Wounded Board the Admiralty agreed to supply principal drugs at the public's expense. By 1804, however, a gratuitous supply of all drugs was agreed to. Not only did this improve the availability of drugs but the gratuitous drugs along with better pay, provided under the administration of Lord Melville, attracted "candidates of superior talents and education" for the positions of surgeon in the Navy.[79]

By 1799, Blane wrote of the British medical officers that they,

> are perhaps more regarded in our service than in that of any other nations, but it would be for the public benefit if they were still more respected and encouraged ... and ... the most effectual inducements for them to enter into the service, and to do their duty when there, are flattering attentions, and a certain degree of estimation in the eyes of the other officers.

Allowing the surgeons respectibility and encouraging them to do their best would, Blane pointed out, "in its operation on liberal minds ... to a certain length, stand in place of pecuniary emolument. It is what is called, in the words of the late eloquent writer [Burke in Reflections

on the French Revolution] 'The cheap defense of nations'."[80] To encourage the skills of surgeons and to help promote their position Blane offered two gold medals to be awarded every two years to the two surgeons who had kept the best journals of their medical services and accounts of their cases while at sea. Founded in 1829, by an endowment of £300, the first medals were awarded in 1832. The selection of the winners was to be made from no fewer than four journals and no more than eight, and the selection based, in the opinion of the medical commissioners, on "the largest share of skill, diligence and learning".[81]

The progress made in reducing disease in the Navy during Blane's career is evident in the tallies compiled by him, which included statistics from his own records, from the official records at the Navy office and those of the Sick and Wounded Seamen, which he had access to while one of its commissioners. The chart[82] below shows those seamen sent sick to naval hospitals all over the world in comparison to the number of men voted by parliament.

Year	Men Voted	Sent Sick	Proportion of Sick To The Number Voted
1782	100,000	31,613	1 in 3.2
1795	85,000	21,373	1 in 4
1799	70,000	28,592	1 in 2.45
1804	100,000	11,978	1 in 8.33
1813	140,000	13,071	1 in 10.75

In addition the mortality rate fell from 1 in 42 in 1779 to 1 in 143 in 1813.[83]

Blane's efforts were recognized by the Admiralty in the changes made to the regulation book in 1805 that incorporated many of his recommendations. In a letter to Spencer Perceval, the Prime Minister,

in 1809 Blane wrote of his contributions to the improved health of the Navy and to the new regulations.

> In the year 1805 it will be found in the correspondence of the Privy Council and Admiralty Office, that it was recognized and admitted that the highly improved state of health of the Royal Navy had been in a great measure owing to the various arrangements suggested and adopted from my writings, and the regulations established while I was a Commissioner of Sick and Wounded Seamen. [84]

In further fighting disease, Blane was optimistic of future medical discoveries that would bring about additional reforms in the Navy.

> When we perceive ... that certain useful and important discoveries and inventions have been made, some of them drawn from the deepest recesses of science, others found lurking under the very surface of nature, which the most profound and enlightened minds could before hand hardly conceive, or believe to be possible, does it not afford a cheering and consolatory prospect, ... that there may still be in store for us, in the boundless progression and endless combinations of knowledge, of mitigating human misery, and of making accessions to the power of man over nature which have not yet been dreamt of in our philosophy. [85]

The importance of continuing to strive for medical reforms was something Blane never questioned. In his Statements of the Comparative Health of the British Navy (1815), he took to task those who did not put as great an emphasis on the benefits of healthier seamen and ships.

> It may be alleged by those who are disposed to question this position, that it is not the improvement of health alone that ships are enabled to keep the sea at all seasons, and in all climates for an indefinite length of time. This is certainly true, for the sheathing with copper besides adding to the speed of ships has proved of incalculable benefit by superceding the necessity of frequent repairs, whereby much time was used to be wasted in harbours. [86]

Blane noted, that in 1779,

> there were no ships of the line coppered except four, composing the squadron which Lord Rodney carried to the West Indies and the Bedford of 74-guns. In the year

> 1782, the whole British Navy was coppered. It may further be alleged that by means of recent discoveries in astronomy and mechanics, ships are enabled to keep the sea in prosecution of long cruises and voyages, whether for the purpose of war, commerce, or geographical science without losing time and incurring danger by making land for the purpose of correcting longtitude. All this is admitted. But these considerations are so far from disparaging the benefits of health, that they give it additional importance, for it is manifest that without the supply of lemon juice, and the other means of maintaining health for a sufficient length of time, the advantage of copper sheeting, the faculties in finding the longtitude by chronometers, telescopes, and astronomical tables, which do so much to honour the human intellect, particularly to the age and country in which we live, would be in a great measure frustrated. It would be of little avail that the depths of mathematical science, the elaborate researches of mechanical, optical and chemical philosophy, would be called to the aid of navigation, so as to co-operate so admirably in carrying it to its present exalted state of perfection, unless the means of preserving health were to keep pace with these mighty improvements. [87]

He concluded his thoughts on the importance of this matter by saying the "arts, sciences, and professions have a reciprocal bearing on each other, conspiring to bring about the greatest sum of human enjoyment, and affording a field of contemplation, in which cultivated, benevolent, and pious minds delight to expatiate" (my italics).[88] The influence of Benthamism is surely evident here and helps to explain Blane's later application of his reform ideas to society as a whole.

Twentieth century writers confirm the importance of Blane's efforts in the improvement in the health of the Navy. W.J. Simpson, R.S. Allison, Sir H.D. Rolleston and David Hannay all point to the practical changes advocated by Blane. Simpson pointed out that sanitation was a concept that had only just made itself known to English minds and that "it was to the credit of the Navy that the most advanced views on this subject were first promulgated and practised in that service". He further pointed

out, and rightly so, that Blane's recommendations, at first applied primarily to the West Indies Fleet, achieved excellent results. While Blane's success in the West Indies was immediate, his intention was to make an impact on the whole of the Navy and in this endeavour he was persistent enough that by 1795, lemon juice was issued and sanitary reforms were introduced throughout the Navy, the latter augmented in 1810 by the issue of soap to all British ships throughout the world. As a result of this improvement in the health of seamen, Simpson noted, impressment, although not abolished, became less necessary as the Navy became a more rewarding occupation, and after the Napoleonic Wars it was no longer exercised.[89]

Allison and Rolleston corroborate Simpson's study relating how lemon juice only found its way into regular use when Blane was appointed a Commissioner of the Board of Sick and Wounded Seamen and was in a position to ensure that it would be adopted as a preventative and cure for scurvy. Hannay has also corroborated the excellent work Blane did of introducing into the Navy's ships that state of cleanliness which ensured health, efficiency and the power to endure.[90]

From the time that he joined the Navy in 1780, Blane wrote material ranging from short tracts on particular topics of medicine to volumes on medical history and advancements. He is not often credited with the originality and imagination of Lind but this did not concern him because his chief aim was to advertise the many medical reforms he believed necessary. Allison credits Blane with an extraordinary ability to keep careful and precise records of facts; no detail was too small to overlook so his works, in the end, provide "a very complete mirror of the period".[91]

Blane readily admitted that he had not thought of all the ideas he put forth in his writings and freely credited others for their work. At the same time he was aware of qualifications that gave him a particular advantage in his writings. These included the number of years he had "applied his mind to studies and duties nearly connected with subjects of this nature", as a result of his positions as Physician to the Fleet, Commissioner of Sick and Wounded Seamen, Physician to St. Thomas's Hospital and his work as a consultant to the Government on various medical questions.[92]

Rolleston describes Blane as a "clear, graceful" writer who "anticipated possible critisms" within his works (see for example pages 111-112). Blane also devoted much attention to the revision of his works, expanding and keeping them up to date by means of successive editions. One example given by Rolleston was Blane's Select Dissertations on Several Subjects of Medical Science which in 1822 was one volume whereas the 1833 edition was two volumes and contained "references to works and events of much later dates than those of the original papers".[93]

Blane's active career in the Navy lasted until the peace in April 1783 at which time he returned to London. Largely through Rodney's influence, he spent the next twelve years at St. Thomas's Hospital where he was elected as Physician of the Hospital.[94] For the next fifty years, after leaving the Navy, he continued to pursue medical and other reforms regardless of where his career took him. The success he had encountered within the Fleet of the West Indies encouraged him in his endeavours and it is to his subsequent careers and his continued employment of an enlightened attitude that attention will now be focused.

FOOTNOTES

1) Simpson, p.301.

2) Royal Medical Society, p.44; Hannay, pp.253-254,269,271, 279; John Steven Watson, The Oxford History of England (Oxford, 1960), p.215.

3) Keevil, p.122.

4) Ibid., p. 123 which derived information from Adm 7/567 and 8/38.

5) Hannay, p.361.

6) Blane, Observations (1785), p.16; Keevil, pp.130-131; quote from Blane, Observations (1785), p.232.

7) Blane, Select Dissertations, p.65; Blane, A Brief Statement, p.20.

8) Ibid., p.20.

9) Blane, Observations (1785), p.v.

10) Blane, A Brief Statement, p.26.

11) Blane, Observations (1785), p.232.

12) Sir Gilbert Blane, Statements of the Comparative Health of the British Navy, From the Year 1779 to the Year 1814 (London, 1815), p.29; Blane, A Brief Statement, p.20.

13) Gilbert Blane, A Short Account of the Most Effectual Means of Preserving the Health of Seamen Particularly in the Royal Navy (London, 1780), p.66; Blane, A Brief Statement, p.25.

14) Ibid., p.25.

15) Simpson, p.310; Rolleston, 'Blane', p.73.

16) Original letter from Blane to Sick and Wounded Board, 15 July, 1780.

17) Blane, Observations (1785), p.16.

18) Ibid., p.203.

19) Blane, Short Account, p.78; DNB - Blane, p.665.

20) Blane, Observations (1799), p.184; Blane, Observations (1785), p.206.

21) Mathias, p.74.

22) Alfred T. Mahan, Types of Naval Officers (London, 1902), p.151; DNB - Blane, p.664; Simpson, p.301.

23) Blane, A Brief Statement, p.IV.

24) Ibid., pp.21-22.

25) Blane, Observations (1799), pp.320-321.

26) Blane, A Brief Statement, p.22.

27) DNB - Blane, pp.664-665.

28) Blane, Medical Logick, p.125.

29) Ibid., pp.128-129.

30) Blane, Observations (1799), pp.482,484.

31) Ibid., pp.479-480; Keevil, p.319 with quote from Blane's Observations, 3rd edition, p.502.

32) Blane, Short Account, p.51; Blane, Observations (1799), pp.480, 481.

33) Keevil, p.331 with Blane's quote taken from Medical Logick, p.136; Allison, p.29.

34) Blane, Observations (1799), p.489.

35) Ibid., pp.491-492.

36) Simpson, p.304; Allison, pp.172-173.

37) Keevil, p.323.

38) Blane, Comparative Health, pp.72-73.

39) Blane, Observations (1799), p.39.

40) Blane, Comparative Health, pp.72-73.

41) Blane, Observations (1785), pp.58,282-283,292-293.

42) Ibid., pp.307-310.

43) Ibid., pp.312-313.

44) Blane, Observations (1799), p.490 (quote); Keevil, pp.320-321.

45) Simpson, p.304; Keevil, p.321.

46) Blane, Comparative Health, p.16.

47) Keevil, pp.340,345; Blane, Observations (1799), p.342.

48) Blane, Comparative Health, p.16.

49) Blane, Observations (1799), pp.342-344.

50) Ibid., pp.392-395.

51) Ibid., pp.402-410.

52) Blane, Short Account, p.22; quote from Blane, Observations (1799), p.271.

53) Ibid., pp.447-451.

54) Blane, Short Account, p.34.

55) Keevil, pp.342-345.

56) Blane, Observations (1785), p.441.

57) Blane, Observations (1799), p.232.

58) Ibid., p.232.

59) Blane, Observations (1785), pp.52-53.

60) Ibid., p.247; Blane, Select Dissertations, p.26; Simpson, p.311.

61) Blane, Observations (1799), pp.262-263; Blane, Short Account,

p.20.

62) Blane, Observations (1799), pp.64,263.

63) Blane, Short Account, p.28; Blane, Observations (1799), p.253.

64) Blane, Observations (1785), p.269.

65) Blane, Comparative Health, pp.20,21.

66) Ibid., pp.18-19; Keevil, pp.255-256.

67) Blane, Observations (1785), pp.241-242; Blane, Observations (1799), p.222.

68) Lloyd, p.134; Keevil, p.77; Blane, Observations (1785), p.317.

69) Ibid., pp.247-252,255-256; quote from Blane, A Brief Statement, p.14.

70) Blane, Observations (1785), p.145; Blane, A Brief Statement, p.13.

71) Blane, Observations (1785), pp.49-50.

72) Blane, A Brief Statement, p.14.

73) DNB - Blane, pp.664-665; Keevil, p.136.

74) Blane, Select Dissertations, p.9.

75) Blane, A Brief Statement, p.51.

76) Ibid., p.17.

77) Blane, Comparative Health, pp.26,28.

78) Rolleston, 'Blane', p.76.

79) Ibid., p.76; Keevil, p.46; Blane, Comparative Health, p.27.

80) Blane, Observations (1799), p.ix; Blane, A Brief Statement, p.51.

81) Letter from Gilbert Blane written 10 October 1829 to John Wilson Croker, ? in Chief to the Admiralty.

82) Blane, Comparative Health, pp.52-53.

83) Mathias, p.81.

84) Original Letter from Blane to Rt. Hon. Spencer Perceval, 2 November 1809.

85) Blane, Comparative Health, pp.82-83.

86) Ibid., p.49.

87) Ibid., pp.49-51.

88) Ibid., p.51.

89) Simpson, pp.301,311-312.

90) Rolleston, 'Lind', p.186; Allison, p.175; Hannay, p.275.

91) Allison, p.176.

92) Sir Gilbert Blane, Warning and Admonition to the British Public on the Introduction (Now Well Ascertained) of the Cholera of India (London, 1831, 2nd edition), p.1.

93) Rolleston, 'Blane', p.78.

94) Allison, pp.169-170; Munk's Roll, p.326.

CHAPTER FOUR

> Health is so great a constituent of human felicity, that we might well expect it to be more frequently enumerated as one of the summum bonum of human happiness.[1]
> - Gilbert Blane

Despite the fact that Blane left Scotland to reside in England, he always remained a patriotic Scotsman. This was reflected in his retention throughout his life of "the aspect and accent of a Scotsman". He did not exhibit the "external graces or artificial attractions" which were common to so many of his contemporary physicians. His lack of concern for the often pretentious side of his profession and his rather cool temperament, led his junior officers, according to Sir Astley Cooper, to nickname him 'Chilblaine'. Such thoughts by his junior officers did not, however, detract from his abilities or interfere with his career. The position he obtained in 'polished' society was an achievement of his "talents and industry".[2] Blane is often described as having possessed a "great original force of character" and having accumulated a vast store of knowledge, not just in the medical field. In the Dictionary of National Biography he is credited with having "united in an uncommon degree adequate scholarship and considerable dialectical skill with scientific acumen and good administrative capacity". At the end of the War in 1783, the principal officers of the West Indies Fleet thought so highly of his capabilities that they unanimously recommended that the Admiralty grant him a pension of ten shillings a day as a recompense, his appointment as Physician of the

Fleet precluding half-pay upon his retirement. The Admiralty agreed to this arrangement, and even went so far in 1802, on the recommendation of the Lords of Admiralty, to double Blane's pension.[3]

While Physician to St. Thomas's Hospital, Blane married Elizabeth, the only daughter of a London merchant, Abraham Gardner, on 11 July, 1786, and they subsequently had six sons and three daughters of whom only two sons survived the parents. Their marriage lasted until 9 July 1832 when Lady Blane died, a victim of a cholera epidemic.[4]

The period between 1783 and 1795, his term as Physician at St. Thomas's Hospital, can be seen as the second stage of Blane's career. At the time of his appointment, the hospital contained 500 beds and as a result of perpetual overcrowding, it proved a breeding place for infectious fevers. So serious was the situation that fevers had claimed, in the year before Blane took up his position, the lives of his two immediate predecessors, as well as one surgeon, and several attendants. Blane reduced the number of beds made available, thus preventing overcrowding, and adapted for St. Thomas's the methods he had developed on board ship for the prevention of disease, such as ventilation and cleanliness, with equal effect. He found that his regime reduced mortality rates from 1 in 14 to 1 in 16.2.[5]

Through Blane's efforts, St. Thomas's gained a higher standard of service and health while, in turn, providing Blane with an excellent opportunity to collect substantial data for his subsequent studies. Writing absorbed much of his interest and perhaps accounts for the lack of impression he made in the area of clinical training while at the Hospital. His demeanour towards junior officers and students may have

been cool but he was concerned to educate as wide an audience as possible with his writings. His Observations on Disease (1785) was not written exclusively for the benefit of the medical profession but aimed also at commanders of ships "upon whom chiefly the prevention of sickness depends". Other works from this period include a Croonian Lecture, "On Muscular Motion", read to the Royal Society in 1788, and a paper, reflecting data accumulated at St. Thomas's and substantiating many of his theories, "On the Comparative Prevalence, Mortality and Treatment of Different Diseases in London, illustrated by abstracts of cases which occurred to the Author at St. Thomas's Hospital (1783-1794) and in his private practice 1795-1806".[6]

While connected with the hospital, Blane's private clientele increased considerably and together his private practise and his hospital appointment occupied a large part of his time and energy. Among his private patients were many distinguished people. In 1785, he was appointed physician extraordinary to the Prince of Wales, the future George IV, in consequence of a recommendation by the Duke of Clarence, later William IV, with whom Blane had become acquainted, personally and professionally, during his naval career. In 1788, he was appointed physician to the Prince of Wales' household and his physician in ordinary. He continued in this latter capacity during the reigns of George IV and William IV.[7] In 1786, he was engaged as physician to the Duke and Duchess of Cumberland, and in 1804 to the Duchess of Devonshire.[8] In subsequent years his private practice continued to play a major role in his career.

Upon the outbreak of war in 1793, Blane was appointed Physician to

the Fleet, the senior medical post in the Navy, which he held concurrently with his post at St. Thomas's. His work at the latter institution came to an end when he resigned in 1795 to take up the position of a Commissioner to the Board of Sick and Wounded Seamen. This marked the third and final stage of his active career. His time was filled primarily with his duties on the Board where he continued to strive for medical improvements in the Navy. He was also frequently consulted by various departments of the Government on aspects of sanitation and matters of public health. It was for these consultations in public affairs, naval, military and civil, that Blane was especially well known in the early nineteenth century. In 1799 he was asked by the Government to join several eminent physicians to draw up the rules which were to form the basis of the Quarantine Act of 1799. That same year, when the Army returned from Egypt, the regulations drawn up by Blane and his fellow physicians were implemented to guard against the danger of introducing the plague into Britain. In 1802 the Home Secretary, Lord Pelham, consulted him on means of keeping provisions and ships free of contagious fevers in an attempt to minimize the mortality rate of convicts transported to Botany Bay. The Board of Control also sought Blane's aid, requesting him to frame improved regulations for the medical services in India.[9] In a letter written in 1809 to Spencer Perceval, Prime Minister, Blane described the services he had provided up to that time to the various sectors of government. "Besides the Naval service, I may, without the least fear of contradiction, affirm that no other person in the profession has been so much employed and so frequently consulted by other departments of the state, civil and military."[10]

Apart from government departments, other authorities were equally anxious to solicit the help of Blane. In 1799, the Turkey Company, controlling the whole of the Levant Trade, consulted Blane on the quarantine regulations to prevent importation of the plague. Blane received acknowledgements from around the world for the services he rendered on 'medico-political' questions. "The Sovereigns of Russia and Prussia presented me with gold medals and other marks of approbation and the President of the United States of America wrote me a letter of thanks in his own hand for my answer to a reference made to me on a question respecting public health." Closer to home he had "the honor of being known to His Majesty not only by name and character but personally and publicly for more than half his reign and have nearly the same time been honored with the protection and enjoyed the personal and professional confidence of His Royal Highness the Prince of Wales."[11]

As a result of his dedication and skill, Blane had many honours bestowed upon him. A list of the associations to which he belonged is impressive and bears out the high degree of recognition he enjoyed. He was a Fellow of the Royal Societies of London, Edinburgh and Göttingen, a corresponding member of the Imperial Academy of St. Petersburg and of the Royal Academy of Sciences of the Institue of France (1826), and an Honorary Member of the Royal College of Surgeons of England (1829). Rolleston notes that in recognition of his abilities, Blane was twice voted to the prestigious position of President of the Medical and Chirurgical Society in 1813 and 1814 and was a member of the select 'Society for the Improvement of Medical and Chirurgical Knowledge', founded by John Hunter and consisting of only nine members.[12]

In 1797 when the Admiralty established a central medical board to control, generally, medical standards in the Navy, Blane and Dr. Robert Blair, the two Physicians of the Fleet, were appointed to it under the chairmanship of the First Sea Lord. It was, however, the Board of Sick and Wounded Seamen that gave Blane the executive power to effect reforms. Blane's duties as commissioner on the Board of Sick and Wounded Seamen included paying for the medical articles required by seamen and for their sick-quarters on land. A letter from the Office of the Sick and Wounded Seamen to Lord Nelson in 1798, authored by Blane and two other commissioners, provides an example of the Board's duties. A portion of the letter reads: "We have received your Lordships letter of the 15th of August last, enclosing a voucher for the purchase of a quantity of lemons and onions, for the use of the sick on board the Squadron, under your Lordships command, and a list of the ships that were supplied with the same, and we beg to acquaint you that we will accept the Bill." Other duties of the Board included the investigation of complaints concerning medical men on board H.M. ships. A letter in 1804 from the Board refers to the conclusion of an investigation into the alleged "neglect and inattention" of Mr. William Smith, Surgeon on Board the Ruby.[13]

The Board of Sick and Wounded Seamen continued in its capacities until 1802 when, with the Peace of Amiens, there was a reduction in the naval and military establishments. While employed on this Board Blane was in a position to ensure that many of the recommendations he had been making since 1780 were carried through, such as those designed to improve the sanitary conditions on the ships and to ensure superior arrangements

for the provisioning of the fleets on foreign stations, particular attention paid to the supplies of lemon juice which, as has been noted, became a regular item in the seaman's diet from this time forward.[14]

With the Peace of Amiens, Blane retired from the Board and received a doubling of the pension first awarded him in 1783. Although his retirement was largely a result of the winding down of the Admiralty, the issue of the right of physicians and surgeons employed by the Admiralty at the Naval Hospitals to continue simultaneously with a private practice was also involved. In 1795 when Blane joined the Board, it had been granted that private practice would be permitted at least in peace time. By 1802, the situation had altered and it was decreed by the Admiralty that "all medical officers of Naval hospitals, whether in war or peace, should abstain from civil practice". In the intervening years, there had been a running debate on the question with Blane in favour of private practice and others, such as Trotter, opposed to it. Trotter believed that private practice led to gross abuses on the part of the medical officers concerning their military duties. Blane's argument, outlined in his Select Dissertations, was that as long as an individual officer's duties were not neglected, a practitioner could actually increase his professional experience by occupying his spare moments with outside cases. In support of this view, he stated that during his term on the Board of Sick and Wounded, he had had only two cases come before him involving the abuses Trotter was concerned about. Blane's career, itself, was an excellent example of the work that could be accomplished while maintaining both an official duty and a private practice. Blane also pointed out that any candidate applying for a

vacant position in one of the metropolitan Hospitals who declared he would devote his whole attention to the duties of the hospital would probably be rejected by the Governors, as they would be aware that an individual would be unable to find sufficient employment within the hospital to fill his days. Blane's position was not upheld by the Admiralty.[15]

A crucial feature of the work of Blane and the other naval medical reformers was that, apart from the dramatic impact on the health of seamen, their reforms could be applied to the poor as a whole. Urban dwellers in Britain at this time suffered from the same types of diseases spawned in an atmosphere of filth and overcrowding. In the Navy measures advocated by its doctors, except in the case of scurvy and smallpox, were not specific to the diseases because the cause of these other diseases was unknown. The preventive measures were general and were therefore able to have a wider effect on health and survival rates, though the systematic programme of social medicine developed in the Navy because it was aimed at an adult male community was therefore limited, to an extent, in its application to the wider national community. Still, it effectively complemented the work of such civilian medical reformers as William Buchanan. It is difficult to assess, however, the actual effect on society at large of the naval (and military) medical reforms. Whereas practical success in the services depended on the authoritarian environment that compelled strict application of rules, the tradition in British society of opposition to strong, effective government led local civilian authorities to resist the centralizing and authoritarian pressure of medical opinion that alone could ensure effective,

compulsory action. Individual initiative, on the other hand, was too often restricted by low income; most could not afford "even the most elemental improvements in diet, clothing, shelter, warmth and cleanliness".[16]

While difficult to assess the actual effect of the naval medical reforms on British society, it is possible to examine some of Blane's endeavours outside his naval appointments at St. Thomas's Hospital and on the Board of Sick and Wounded Seamen. In his later career, Blane remained just as devoted to the cause of reform. In this, he was part of a far larger trend towards reform of society and institutions, as a whole on a scientific basis. During his life time, Britain was rocked by revolutionary change; unprecedented growth in population coupled with a revolution in agricultural and industrial techniques and exacerbated by political revolution, expressed most forcefully in France, engendered a social revolution of massive proportions. Fears aroused by the French revolution caused a reaction to political change and the government resorted to a policy of repression during the French revolutionary wars in an attempt to reestablish the old social order. This reaction did not so seriously affect social change. The rising middle class and elements of the landed aristocracy were influenced by doctrines such as Adam Smith's laissez-faire, Bentham's utilitarianism and the impulse to combat human suffering that arose from the humanitarian spirit bred in the enlightenment. The Royal Institution, founded in 1799, was in the forefront of a movement Morris Berman describes as utilitarian that encompassed a wide range of people who shared "a certain disposition towards problems, which they regarded, in

varying degrees, as tractable via quantification and the statistical accumulation of facts." Science, to them, "was a tool by which to construct an ordered society".[17]

Blane was certainly aware of the work of such fellow Scots as Adam Smith and, later, Henry Brougham, and, as noted in Chapter Three, he seemed to have had an affinity for Bentham's utilitarianism. In addition, the humanitarian spirit of the Scottish enlightenment provided him with an underlying stimulus to reform, while his career with the Navy provided the reforming drive with a focus. Released from service to the Navy his focus naturally broadened to encompass larger social issues. It is not certain when Blane joined the Royal Institution but by the 1820s he had become one of its governors and was extremely involved in studies carried out by the Royal Institution on behalf of the government.[18]

Interestingly, one of the first reform movements Blane became involved in after his naval service was with the prisons. This had been a major focus of Bentham's own work, though there is no evidence availabe to suggest a direct link between these two reformers. On 24 November 1802, Blane wrote to William Pitt suggesting possible changes to be considered in the question of reforms in health standards within prisons in the Metropolis. Apparently Pitt had offered some suggestions, which are not noted, but these had been rejected by the Lord Chancellor, Lord Eldon, who nevertheless recognized the need for reform and placed Blane in charge of examining the existing conditions. One major change suggested by Blane was a requirement of reports, from the prisons, at short and regular intervals of from six weeks to three months

that would provide the government with information on the existing state of health in the gaols. The reports, he decided, would be most effective if produced in a standard form listing those areas it was thought necessary to report upon. Ideally, the reports would come from all the prisons of Great Britain and Ireland instead of just those of the Metropolis. According to Blane there were several advantages to regular reports. First, Magistrates and civil officers would pay stricter attention to the rigorous execution of their duties. Second, if problems were noticed in the returns, steps towards their correction could be instigated without offence to the feelings of the men who were responsible for these institutions. Third:

> In case ... neglect should actually exist and it should appear that contagious sickness has continued to spread or prevail for a length of time or frequently to recur, Government will not then hesitate to impose actively by positive directions ... concerning the state of prisons and the most effectual means of eradication and preventing such disorders.

Finally, as with his medical reforms in the Navy, Blane suggested that "the preservation of health is a measure of economy in as much as the maintenance of men in sickness costs more than that of men in health".[19]

Perhaps of more interest are Blane's arguments in favour of change. One argument concerned the extent of destruction within society, as well as in the prisons themselves, that could be directly linked with the state of the prisons. His primary concern, as usual, was to preserve human lives by educating those responsible in the prevention of sickness and to show that change was possible. In the same letter to Pitt, he suggested one benefit of a positive change.

> As sickness usually prevailing in gaols is of the infectious

> kind and as it not only makes its way into society, but has occasionally proved fatal to great numbers of the courts assembled for trying offenders as happened at the Clark Offices of Oxford and at the Old Bailey in the year 1750, it is an object of high importance to prevent and extinguish infectious disorders in prisons.

Blane reasoned that,

> the study of health is in the eye of humanity a primary object of consideration on its own account but it has this farther recommendation, that it affords, the most certain and convenient criterion of the good or bad treatments of the persons confined, and of the good or bad conduct of those concerned in their management. Whenever prisoners are found to be in habitual good health we may rest assured that there the treatment of them with respect to food clothing and accommodation and cleanliness is such as it ought to be; and it will also in some degree serve as a measure of the attention paid to their morals in as much as it will prove that they are restrained from intemperance which never fails more or less to affect health. If on the other hand sickness should be found to prevail, it will be certain proof of the neglect mismanagement or deficiency somewhere in the necessary points of attention. [20]

In 1823 Blane was again drawn into the issue of prison reform. Through contact with Sir James MacGregor, the medical attendant at Milbank penitentiary, a prison constructed in 1816 on the lines of Bentham's 'panopticon', Blane "learned that a complaint bearing the character of the sea scurvy had broken out at that institution," and he wrote to Sir Robert Peel, Home Secretary, on 31 March offering his advice on treatment of scurvy. By the end of April the outbreak had been debated in the Commons and had prompted the establishment of a Select Committee to investigate. Four of the committee members and the four investigating physicians, including Blane, were governors of the Royal Institution. In the evidence he submitted to the committee, Blane blamed the outbreak of scurvy on an inadequate diet and recommended treatment with citric fruits, especially lemons and limes. He also

expressed concern for the mental health of prisoners, a theme that harked back to his early days in the fleet with Rodney. In its conclusions on 8 July 1823, the committee accepted the advice of the physician that diet was at the root of the problem.[21]

The problems at Milbank did not end with this. Fever began to make the rounds of the prison and early in July 1823, Peel authorized its temporary evacuation. In 1824 a new Select Committee was formed to investigate claims that the site of the prison was responsible for the spread of disease. Blane, again called on to investigate, rejected this claim and assigned the blame to cold winters, poor ventilation, lack of food, want of exercise and poor spirits. Most importantly he emphasized the need for cleanliness in the form of "unlimited use of soap and water and brooms, frequent changes of bed and body linen ... also frequent whitewashing". The committee in its report of 11 July 1824 accepted all of Blane's conclusions and particularly emphasized the importance of mental health.

> Referring to the evidence of Sir Gilbert Blane and Sir Henry Halford, on the effect of cheerfulness and innocent recreations upon health, Your Committee wish to throw out, for the consideration of those who manage the Penitentiary whether it might not be proper that a greater degree of personal relaxation should be allowed to the prisoners than is enjoyed by them under the present system; and whether some kinds of games or sports might not be permitted in the prison during a portion of the day. [22]

An inadequate supply of food was not limited to prisons. During and after the French revolutionary wars, Britain was severely affected on occasion by a scarcity of provisions due to successive years of crop failure in conjunction with a growing population and the general economic dislocation caused by the war. In 1800 and 1817 Blane published editions

of his Inquiry into the Causes and Remedies of the Late and Present Scarcity and High Prices in a Letter to the Right Hon. Earl Spencer, First Lord of the Admiralty in an attempt to educate the population about the problems of scarcity and high costs and to search for practical solutions.[23] Thomas Malthus, in his Essay on Population (1798), had addressed the same issue and drew very negative conclusions. His theory that population tended to grow geometrically while the food supply grew arithmetically offered no hope to the poor that they would ever be able to rise above the barest level of subsistence. He believed that government intervention on behalf of the poor would only undermine 'prudential restraints' on propagation.[24] In his Inquiry, Blane also worked from a laissez-faire stance but developed a far more optimistic assessment of the situation. Blane examined the cause of the scarcity of provisions in the belief that this would make it possible to find the root of the miseries of the poor. Beginning with a survey of famines in the previous 350 years, he then proceeded to examine the situation in 1799. The summer and autumn of that year were extremely cold and wet, more so than any other year "in the memory of man". As a result, crops were poor and not much was harvested. In previous generations the situation would have resulted in famine but this was not the case in 1799. Blane attributed this to a number of reasons but primarily to the appearance, in his age, of the middle man in commercial transactions. "Had there not been men who accumulated and reserved these supplies, and conveyed them to where they were most wanted, we must have gone without bread in the months of June and July last." A second dismal year, however, resulted in scarcities. Whereas there had been a surplus to

supplement the poor crops of 1799, in 1800 the surplus in Britain was exhausted. "The want of a surplus essentially distinguishes this year from former years, and goes far towards explaining the continuation of the high prices, more especially when it is taken into account, that the present crop is considerably below an average one."[25]

Secondary causes for the scarcity and high cost of provisions in 1800 included the depreciation of money, the increased consumption in consequence of the war, agriculture not keeping pace with population and manufactures, and finally, the assize of bread. The assize "by establishing a maximum of profit, directly militates against the freedom of commerce, and must therefore be pernicious to society, if there is any reason or justice in those principles now admitted by all enlightened men, and which it is one of the main objects of this letter to illustrate".[26]

By drawing attention to the disastrous effects of scarcity on the poor, Blane hoped to show the authorities that something needed to be done to alleviate the situation before further problems arose. One major problem that had already arisen from the crisis was the decision of the magistrates at Speenhamland in Berkshire in 1795 to attempt to reduce the detrimental effects of the scarcity of provisions by giving a temporary allowance from the poor rates to labourers and artisans with families too large for them to support when wages fell below a fixed minimum determined by the price of corn. He believed this a tactical error for once begun, it became impossible for the government to end the practice when the crisis had passed. The problem was further entrenched in 1796 by Pitt's Poor Law Act which "justified and enjoined" this practice. This practice, Blane felt, contributed to the "idleness,

debauchery and improvidence" of these groups of people by debasing their moral character through the loss of every vestige of self-respect and causing them to abandon a sense of responsibility to themselves, their families and to society.[27]

Blane's general opinion of 'the Speenhamland System' was shared by many of his contemporaries. Bentham described it as "one of the most mischievous practices". Malthus believed that such wage subsidies would merely perpetuate the evil of poverty and lead to an increase in the numbers of paupers living on the borderline of subsistence. Moreover, employers were encouraged to pay workers inadequate wages because they realized the difference would be made up out of the poor rate. Two modern Marxist historians, E.P. Thompson and E.J. Hobsbawm, come surprisingly close to Blane and his contemporaries in their assessment of the system. While recognizing that the system was "impelled by both humanity and necessity", Thompson argues that it was an attempt by the leaders of society to "reimpose the older moral economy against the economy of the free-market" and that it only succeeded in creating a class of pauper labour characterized by moral depravity. As Hobsbawm noted: "It was an attempt - a last, inefficient, ill-conceived and unsuccessful attempt - to maintain a traditional rural order in the face of the market economy."[28]

Apart from the effects of the Speenhamland system on adults, Blane believed that the lack of responsible adult guidance led to a "deprivation of morals, bad example, and neglect of education" in the children. It was to this that Blane attributed the "juvenile deliquency prevailing at this time in the metropolis to a degree never before known". Evidence

supporting Blane was available in a report given by a research committee of the House of Commons which stated that vicious children were uneducated. An additional report by Robert Raikes (1735-1811) stated that "of 4000 young people who had been properly educated only one case of criminal conduct had occurred". Raikes, a printer and newspaper owner in Gloucester, was himself greatly interested in the effects of education on children. From 1780 onward, he was active in organizing "a successful movement for providing education on Sundays for the children of the labouring classes". Blane's other evidence was taken from the changes evinced in Scotland since the introduction of its national education system,

> where by the superior intelligence and virtuous principles, early impressed on the minds of all ranks, the relative duties are inculcated, understood and practised, the mutual attachments are cherished, habits of industry and frugality are acquired and exercised, not merely for their own maintenance, but for the support and education of their children, and as a provision against age and sickness, so as to avoid the degradation of parochial relief to themselves, their offspring, their brothers, sisters, or parents.

Blane's concluding remark was that "the commonalty of Scotland before that time were extremely brutal, idle and vicious".[29]

Blane's role in the movement that sponsored the education of the lower classes, in the hope of creating a calmer and more rational society, was not that significant. Of far greater importance were people such as Raikes, Robert Owen, and Henry Brougham. Owen (1771-1858), a rising industrialist, had devoted much of his life to correcting the suffering that arose among the labouring classes through ignorance and poverty. He believed that, because "man's outlook and pattern behaviour were primarily fashioned by the values of the society into which he was born," those

born into a life of misery and crime were adversely affected by it and society thereby injured. The solution was to use education to mould people both for their own benefit and "for the safety and progress of society". Brougham (1778-1868), whose interest in universal education was stimulated by the success of Owen's New Lanark experiment, devoted much of his political career to the advancement of the education of the labouring classes. Like Blane, a Scot, he was also quick to extol the advantages of Scotland's national education system. Unfortunately the supporters of universal education, though cutting across the political spectrum, were a small group who faced a flood of opposition. Not until after Blane's death, in the era of the great reform bill, did the concept of universal education gain a wider popularity.[30]

Apart from the growing dependency on the government, Blane was also concerned to avoid vicious and violent reactions from the poorer classes of society arising from the scarcity of provisions. He felt that if the wants of the poor could not immediately be relieved then the government should at least endeavour

> to sooth their discontent by shewing them that the ground of their evils is imputable to natural and unavoidable causes, and not to imflame their passions, and exasperate their sufferings, by representing them as flowing from the crimes of their fellow subjects, and thereby impelling them to acts that must aggravate the evil ten-fold, and lead to the most tragical and fatal catastrophies. [31]

In effect, Blane argued that the people would see reason if only they were carefully educated in the facts relating to the scarcity.

Before finishing his discussion of the scarcity of provisions, Blane suggested some possible and practical solutions to be employed to prevent

similar crises from recurring in the future. One idea was the extension of Britain's agricultural cultivation by bringing wastelands under cultivation. Foreign imports would still be necessary in some years, but Britain's internal supplies would be increased. Another idea was the importation of grain by private traders. In 1795, the government had imported a large amount of grain and sold it for moderate prices but this had discouraged private traders from competing in grain sales. The error was soon perceived and importing left to the private sector thereby limiting government intervention.[32]

Blane concluded his letter to Earl Spencer by again stressing the seriousness of the situation to the country as a whole but in particular to those who lived "day to day by their labour". He could not emphasize enough the importance to the well being of the country of keeping these people informed in order to "counteract their prejudices".

> Whoever will study the character of the common people of this island, will find much to admire in them, particularly that aversion to the shedding of blood, and to the vindictive life of edged weapons, which remarkably distinguishes them from all nations of Europe, particularly the more southern. How cruel, then, to abuse the generous nature of such people! It seems particularly incumbent on those in power, and on all persons of education, to sooth, console, and instruct, the industrious artisan and labourer, on a subject on which they are so prone to error of the most dangerous and fatal tendency, to represent to them that this island is like a ship at sea, on a voyage of twelve months, with an inadequate store of provisions on board, and with only a precarious chance of any further supply, and that too great an expenditure, in the beginning of the voyage, would produce a famine before they could arrive in port; that therefore it becomes them to submit with Christian patience to being put on short allowance, not giving way to unmanly repinings, much less disgracing themselves by mutiny. This class of society should also have it explained to them, that it is only by means of high prices that general frugality and dimished consumption can be effected; and it can be made plain to them, that the farmer ought to have such prices as

> to indemnify him for the shortness of his crop, and enable him to continue and increase his tillage the ensuing year; that the farmers who produce, and the dealers who bring the produce to market, for the accommodation of society in general, and of the poor in particular, instead of being the objects of their indignation, ought to be considered as their best friends. [33]

In 1809, Blane was again sought out by the government and given a special mission as Acting Physician General "to ascertain the nature and causes of the great sickness and mortality prevailing in the British Army" on the island of Walcheren. He was further to ascertain if the sick would recover more quickly by remaining on the island than if shipped home. The conditions on this island, off the coast of Holland, had caused no less than two-thirds of the total numerical strength of the Army to be incapacitated from duty, mainly by malaria. Blane was commissioned after the Army's own medical board had lost the confidence of the government through its failure to recognize promptly the problem and to deal with it. The afflicting disease also escaped Blane's ability of diagnosis, but as a result of the medical information contained within his report later presented to parliament during the lengthy investigation of the Expedition to the Scheldt, the Army decided to abandon the island and recall its troops. Normally a duty of the Army medical officers, Blane was further charged with making the arrangements for transporting the sick and wounded back to Britain. His report, dated 1 October 1809, was acted upon by 7 October when orders were given to remove the sick from the island according to his specific instructions. The government's prehaps unprecedented decision of seeking the help of a naval medical officer in an Army matter was a significant indication of his reputation.[34]

The following year, in the autumn of 1810, Blane was sent by the

Admiralty to North Fleet where he was to investigate "the nature and situation of that spot in point of health, with a view to decide, whether any objection in point of unhealthiness would arise to the formation of a projected dock-yard, and other naval establishments at that place". Although he found the place "extremely aguish" he obtained evidence assuring him that once the ground had been paved and built over it would lose its "sickly quality". His report to the Admiralty stated favourable conclusions on the suitability of the North Fleet area for the Navy's use. This incident again reveals the position of distinction Blane held in service and government quarters.[35]

One of Blane's favorite concerns in the 1800s was to protect the people of Great Britain from the scourges that afflicted many of the foreign countries with which Britain traded. His role in drawing up Quarantine regulations in 1799 has already been noted. In 1824 after the merchants and shipowners had raised loud objections to the Quarantine Laws, Blane's professional opinion was sought by a Select Committee set up to investigate means of relieving "commerce from the burdens and inconvenience that press upon it" while simultaneously ensuring the protection of the British public from the dangers of the plague. A Select Committee of 1819 had already established that the plague was a contagious disease against which precautions were essential. The new committee therefore, considered its task to be to ascertain "whether the established system was one that admitted of improvements and whether ... the objections to it might be ... in a great degree obviated". The existing regulations provided for duties based on the class of Bill of Health carried by a ship and on the port from which the ship had sailed.

The length of quarantine of ship and cargo was also based on these factors. The merchants and shipowners argued that the duties were heavier than could be recovered from the price of the goods and that the length of quarantine unduly increased the costs of shipping and maintenance of goods.[36]

In his evidence on 1 and 6 April 1824 Blane argued that the regulations could be ameliorated. In an undated pamphlet, Regulations, Proposed in the Performance of Quarantine at Standgate Creek in addition to those now subsisting and rendered necessary by the admission of ships from the Levant without clean bills of health, he later recounted the advice he had given the Select Committee. He outlined measures to be taken with ships, crews, cargoes and passengers, to ensure a reduced quarantine period would be successful. His first step in the quarantine of cargoes, was to make a distinction between the summer and winter months. The months from May to October were considered the most critical to the occurrence of epidemic diseases and because of this he suggested that the recommended 14 days of quarantine be extended to 40 days. In contrast, the quarantine period he recommended for the six winter months was reduced to 28 days adding that it would be to the benefit of Britain if cargoes arriving from suspected countries could be imported during these months. Also, cargoes subject to quarantine were to be separated from those given a clean bill by means of tarpaulins and bulkheads and the two types of cargo were not to be aired at the same time in the same lazaretto.[37]

While concerned that these measures be applied to incoming cargoes, Blane was careful not to ignore the point of view of the merchants. A

certain firmness was necessary in contending with quarantine regulations yet, as far as was compatible with public safety, he felt the convenience to the merchants should "be studiously consulted, not only from consideration of private justice, and the National Advantage accruing from the encouragement of Trade, but from policy, inasmuch as there is a better likelyhood of restrictions being fairly submitted to when they are conceived not to be unnecessarily rigorous".[38]

Blane's recommendations for passengers and crew involved a 20-day period of quarantine during the summer and 15 days in the winter months. During this time clothes were to be fumigated, scoured or washed and the individuals were to be examined frequently by a Medical Inspector whose duties were to include the inspection of the people and the responsibility of ensuring that the cleansing precautions were carried out. Such measures were to replace the current method of discharging passengers and crews with Clean Bills.[39] In discussing the treatment of the passengers and crew, Blane did not miss an interesting trait of human nature connected with "private adventures of Seamen and Passengers". He suggested that articles brought through by these individuals be allowed to "pass free in order to remove the motives for secreting susceptible articles and sending them out of the ship clandestinely". Incoming ships were to be isolated from other ships and were to undergo similar cleansing methods as the people they carried on board, including sweeping, white washing, scouring and fumigation. He strongly recommended that in the case of plague, the ship and every inanimate object on board should be burnt or sunk. Concluding this article, Blane warned against feeling secure in the fight against the plague because this would lead to a

relaxation in the preventive measures taken and could, quite easily, result in renewed outbreaks in epidemic proportions.[40]

In its report on 14 June 1824, the Select Committee proposed several relaxations of the Quarantine Law. It was suggested that quarantine should be lifted from ships arriving from areas believed to be free of the plague especially if the goods were not deemed "susceptible of conveying contagion," and that the list of goods deemed susceptible be reduced. Ships with a Foul Bill were to proceed directly to Standgate to discharge their cargo and undergo a 21 day quarantine, while those with Clean Bills were to be inspected at Lower Hope in the Thames and upon approval of the Privy Council were to be discharged without a quarantine period.[41]

A bill presented to the Commons in 1825 to give effect to the Committee's proposals aroused oppositon during second reading from some members who did not consider it lenient enough. John Smith and John Cam Hobhouse contested the view that the plague was contagious at all. Smith proposed the total abolition of quarantine to help promote British trade. Hobhouse advocated more liberal laws like those of Holland where the quarantine was only of 3 or 4 days duration.[42]

In a letter to Hobhouse, Blane expressed disappointment that the former had taken such a stand on the question of whether the plague was contagious. He disputed the validity of the evidence Hobhouse had employed and suggested that,

> As I know the depth and correctness of your research, however having probably not extended to professional subjects, I take it for granted that you have been misled by the authority of another in making this statement for the direct mention, as well as the allusion

> to contageon in classical as well as professional authors, are without number. [43]

Though both social reformers (Hobhouse was a radical representing Westminster), in this case Blane's pragmatic recognition of the needs of society clashed with Hobhouse's dotrinaire opposition to government intervention.[44]

In a letter to Smith, Blane attempted to convince him of the fallacy of his views. He noted that there "are not in one or two, seventy or a hundred cases, but in any number that may be required" evidence that the plague could be passed from one individual to another and he pointed to England as a prime example of this phenomenon. "When it last occurred this country was a country of civilization and literature and whoever will look into the records left by Sydenham and Hodges ... will find abundant incontroversable proofs of the actual transmission of the Infection." Blane further pointed to the evidence he had presented to the Commons in April 1824, as proof of the fallacy of the opponents viewpoint. He also rejected the argument about the Dutch quarantine. The writings of Dr. Granville recorded the precautions taken by the Dutch in the Mediterranean. Also, Blane observed that Amsterdam had been visited by the plague no less than fourteen times during the seventeenth century which indicated that their quarantine laws were not strict enough.

Despite the approval of some leniency, Blane protested against the general idea and warned the legislature against the "abolition of all sanitary precautions. Let us not be lulled into security by long exemption ... if in this situation we should be overtaken by this dreadful calamity the means of checking it would be retarded and paralyzed by the great reluctance to

believe in it, and the abolition of preventive Institutions."

Having argued against the evidence presented by the opponents to the Bill, and having provided substantial evidence in favour of the Bill, Blane asked Smith how any educated individual could fail to recognize the need for the Quarantine Bill.

> Can you, Sir, on reflection, possibly believe that what as a gentlemanof education, you must have heard or read of the tragic incidents at the Old Bailey in 1750, at the Black Assizes of Oxford, the like of those of Taunton, Exeter and other places, are mere fables ... It is my duty as a man and as an act of gratitude to my King and country who have so liberally encouraged and rewarded me to protect society to the utmost of my power from such fatal errors.

Blane concluded with the remark that the Home Secretary, Sir Robert Peel, had taken a stance in direct opposition to those who argued that the plague was not contagious.[45]

In the event, the government adopted the moderate position that, because the contagious nature of the plague was still very controversial, it would be unwise to leave Britain unprotected. Thomas Wallace, vice-president of the Board of Trade, informed the House that, "the very existence of these doubts was enough to deter the government from hazarding any alterations, which would have the effect of unhinging our securities against the plague". The Bill passed third reading on 3 June 1825 without having undergone substantial revisions.[46]

Concerned as he was to improve health standards and to prevent the occurrance of disease, Blane fought hard to curb the prejudices that arose against the smallpox vaccination developed by Edward Jenner (1749-1823) and announced in his Inquiry into the Causes and Effects of the Variolae Vaccine in 1798. Smallpox had been particularly virulent in

Britain in the thirty years prior to Jenner's discovery, yet, though his ideas spread rapidly throughout Europe despite the war, the attitude of the British medical establishment was one of hostility. The efforts of a determined few helped slowly to break down the barriers; the vaccination of the Duke of Clarence, one of Blane's patrons, and his household in September 1798 did much to promote the vaccine among the higher classes.[47] In an attempt in November 1806 to gain concrete medical backing, Blane wrote to the Royal College of Physicians but met with little success. In 1811, he discussed the merits of the vaccine in A Serious Address to the Public on the Practice of Vaccination. He noted that one method previously utilized to combat smallpox and found by many physicians to be wanting in effectiveness was the inoculation "with the disease itself of those who had not already caught it". The inoculation first widely lauded by Lady Mary Wortley Montagu in 1720, became increasingly popular all strata of society. Blane provided evidence of its ineffectiveness, by bringing attention to the increased mortality rate contained within the Bills of Mortality of London. Between 1706-1720, the number of deaths due to smallpox had been approximately 70 in 1000, but by the end of the eighteenth century, between 1784-1798, this figure had risen to about 95 in 1000. Of this situation Blane wrote, "This evidently arose from inoculation destroying more than it saved."[48]

In contrast to the failure of inoculation which at best aimed only at the mitigation of the disease, Blane observed that Jenner's vaccination discovery was aimed at the extirpation of the smallpox. Blane was aware of the apprehensions aroused by the vaccine but believed that the condemnations of the vaccine had been unfair. He wrote,

> the boldness and novelty of such a pretension made it, at first, be rejected by many, who would not even deign to examine it's [sic] merits. That a morbid poison taken from a domestic animal should have the effect of destroying the susceptibility to small-pox, without producing any dangerous disorder itself, was considered by all the world, enlightened and unenlightened, either as an extravagant fancy or, at least, as a proposition to be entertained with the utmost hesitation and caution.[49]

Yet, despite opposition to the vaccination, many individuals underwent this treatment and, as Blane wrote, "the lights of evidence ... broke in so rapidly, that the truth of this fact, as it affects the dearest interests of humanity, was fully established to the satisfaction of everyone who had the means and the capacity of appreciating the evidence in it's [sic] favour". Blane noted that those individuals who supported the use of the cowpox vaccine were well aware that it would not preserve every life, but "it would nevertheless be of inestimable value to mankind, for it would still prove an instrument for annihilating, more or less gradually, the whole existing stock of variolus infection". Blane thus concluded that when rationally examined the vaccine was well worth implementing as a standard practice in society. He was indignant, therefore, in this address, that no acts of parliament nor "regulations by police" had been passed to ensure the use of this vaccine.[50]

In 1819, he wrote A Statement of Facts, Tending to Establish an Estimate of the True Value and Present State of Vaccination and this "came before the larger audience of the public" at an opportune time. A severe epidemic of smallpox in 1818, had renewed doubts about the effectiveness of the vaccine. Blane began his article by noting the advancements made since Jenner's discovery in 1798. "It is now twenty

one years since Vaccination was promulgated in this country by Dr. Jenner, and fifteen years since it began to produce a sensible effect in diminishing the mortality from small-pox."[51] He again referred to the Ratio of the Mortality of Smallpox to the Total Mortality. Included in his statistics were the following figures:

Dates	Number of Deaths
1745-1759	78 in 1000
1785-1798	94 in 1000
1804-1815	53 in 1000

[52]

The increase in deaths towards the end of the eighteenth century show the ineffectiveness of the methods then being employed. The decrease after the turn of the century provided proof of the "clear, undeniable and great diminution of [smallpox] since the introduction of the Vaccination". Blane also provided examples from the continent; in Vienna in 1804 "no cases occurred, except two strangers, who came into the city with the disease upon them". "In 1805 there did not occur a single death from it in Copenhagen."[53]

In addressing the arguments against the vaccine, Blane rejected as spurious the so-called failures where the individual treated suffered ill-effects from the vaccine. Although many of the symptoms of cowpox were the same, they did not last as long nor have the degree of ill-effects of the true smallpox. He commented that "it is of the utmost consequence to establish the strong and important distinction between small-pox, properly so called, and that which takes place after Vaccination, which may be called the imperfect, or five day small-pox". He chastized those individuals, particularly doctors, who failed to make a distinction and who proceeded to present such cases as evidence of the

failure of the vaccine. Blane concluded that the "importance of this ['morbid poison'] as a physical curiosity, vanishes to nothing, when the unexampled benefits of it to mankind are fairly weighed".[54] So anxious were he and Jenner to show the public the attributes of the vaccine that in 1820, Blane's work, with some additions, was republished at Jenner's expense, and distributed gratuitously by the public establishments for vaccine inoculation.[55]

Smallpox was one disease that had perhaps a greater impact on civilian society than on the services. At sea, smallpox was not as devastating as the typhus or scurvy. Lind's records showed 53 recorded cases of smallpox as opposed to 2174 cases of fever. Blane's 1782 table for the West Indies recorded 49 cases of smallpox and 806 for fever. It may seem surprising that the naval authorities moved with more promptitude in introducing the vaccination into the fleets than they had with Lind's treatment for the scurvy, but they were pushed into action by Blane in his role as Commissioner on the Board of Sick and Wounded Seamen. As early as 1800 the vaccination was being offered in many of the fleets. July of that year saw Doctors Marshall and Walker travelling to the Mediterranean with a supply of the vaccine for the fleet there and in August the Channel fleet crews were offered the vaccine. Although not compulsory, naval surgeons were given orders in 1800, to vaccinate any seaman who requested it. Unfortunately, in the new edition of regulations for naval surgeons in 1805, the authorities refused to make the vaccine mandatory in deference to the prejudices against it. The Board of Sick and Wounded suggested, however, that the regulations carry a paragraph encouraging the practice and that a column in the muster books of the

ships be set aside to record if a man had received the vaccine or not.[56] While the vaccination was not made compulsory in the Navy until 1858, the encouragement by naval surgeons was to be a strong factor in favour of use of the vaccine within the Navy. Similar success was enjoyed in the Army where the vaccine was introduced in 1803.[57] The men serving in the forces therefore benefitted much more than those on land. Blane wrote:

> It is somewhat humiliating to reflect that, while there is no country which has received more striking and unambiguous benefits from this discovery, there is none which has prized it less, nor availed itself of it so little. Formerly, smallpox was one of the greatest embarrassments to the operations of the armies; Ships of war were occasionally under necessity of quitting the seas from the prevalence of this disorder among their crews. Those lately, at the head of the Army and Navy, with that wisdom and humanity which becomes those who direct the affairs of a great and enlightened nation, recommended and enforced the practice of Vaccination in both these departments, to the great furtherance of the public service. Their example has by no means been followed among the civil population of England. [58]

Attempts were made in 1812 and 1814 to pass bills through the House of Lords promoting vaccination and discouraging inoculation, but their author, Lord Borington, though an enthusiastic supporter of the vaccine, lacked the requisite ruthlessness and quailed before the critics of his bills. Both were withdrawn - a great victory for the anti-Jenner forces. It was not until 1840 that a Vaccination Act was passed which "made Jenner's discovery the law of the land".[59]

Blane's interest in public affairs and reform continued into the last years of his life. In 1831, two editions of Blane's Warning and Admonition to the British Public on the Introduction (Now Well Ascertained) of the Cholera of India were published to examine the danger to Britain

of the cholera outbreak and offer recommendations for dealing with it. As usual his recommendations were carefully reasoned and easily understandable, the hope being to persuade all sides of the benefits to be gained from the changes he advocated. Blane first examined the government's efforts against a possible cholera outbreak. Britain's 'paternal government', aware of the potential danger, had "established a Board of Health ... for the purpose of checking the progress of a disease so novel, so rapid in its progress," but this was insufficient because, "the labours of the Board are not required to commence till the disease has actually made a landing, and taken post in the country". Blane advocated that steps be taken to repel the disease before it arrived on the shores of Britain. To accomplish this, his article set out "the fruits of his studies adapted for an early, speedy, and universal circulation among the British Community, particularly in the sea-port towns on the east coast of England and Scotland". Blane requested that as many as possible within a community be made aware of the preventive measures, with particular attention paid to "the squalid part of the population" because they, "by their filth, stench, bad clothing and bad and scanty diet, and other constituents of misery, not only counteract and harbour infection, but attract it as it were".[60]

As with most of the sea diseases, Blane had no understanding of the cause of the disease and his advice was limited to the same general preventive measures including cleaning with brooms, and mops, though he recognized that it might be difficult to persuade this class of people to comply with such a request. He thought that they should at least be encouraged to practice temperance as it was believed that this vice

caused deterioration and loss of health and premature death, not to mention "idleness, sedition, and extinction of, and indifference to, all religious obligations and relative duties". Aware that these people would be suspicious of any reforms, Blane added that there would probably be less resistance if reforms were imposed "through lenient and unarmed ways", suggesting that instead of soldiers or the sheriff's officers enforcing these changes, the clergy or appointed civilians could take on the task.[61]

In the same year as his work on cholera, Blane also felt compelled to comment on the severe civil disturbances that accompanied the agricultural distress in the south. His book, entitled Reflections of the Present Crisis of Publick Affairs, with an Enquiry into the Causes of the Existing Clamours and Grievances, dealt with the best means "not only of preventing famines, but also of guarding against the evils of discontent and riot", and covered a wide range of topics, including Population and Subsistence, Health, Corn Laws, Currency, Education, Religion and Morality, and Employment.[62]

Much of this book was a reworking of the ideas he had devloped in the two editions of his Inquiry into the Causes and Present Scarcity and High Price of Provisions. Reflections contains, however, some ideas that need further examination, primarily the connection he drew between Morality, Religion and Education and how these could affect the populace of Great Britain. Blane clearly regarded education as of the highest importance "not only because it stands foremost in the course of human life, but because it has been more the subject of doubt and disquisition, as a corrective of that bad conduct in the commonalty to which so large

a share of the present distress is alleged to be imputable".

> Strong objects have been brought against that sort of education [that is, anything in excess of religious and moral teachings] in which the mere improvement of intellect in the labouring classes is concerned. It has been alleged, that by giving them certain high notions, it creates a discontented and seditious disposition.

Blane refuted this argument pointing out, first, that "when knowledge comes to be diffused it is no longer that distinction which gives them any pretense to an exemption from the most ordinary duties of their station;" and second, that investigations into the matter had shown that none of the "modern disturbances have been accused of any such tendency; on the contrary, the most ignorant have been the most mischievous. And both reason and experience plead that a certain share of knowledge tends to humanize the mind."[63]

Blane suggested that an educated populace should be seen as a potential benefit to the country for "it is on the good principles and state of mind infused in an early life into the commonalty that the good order of society depends, and as they constitute the great majority of the species, most attention is due to them in the eye of the patriot, the Statesman, and the Philanthropist." Blane was realistic enough in his aims to appreciate that the ploughman would find little value in being taught algebra but he felt that care and judgement could be "employed in selecting and limiting that species and degree of knowledge which is respectively adapted to the several gradations of society". Combined with the religious and moral teachings, such an education should be within the individual's reach, even at the lowest rank of society, at an early age.

As proof of his proposals, he again referred to the situation that existed, and had existed for a considerable time, within Scotland.

> We hear of book-clubs among the mechanics and labourers of Scotland without any injury to their morals; on the contrary, they are thereby kept from the ale-house, nor have we heard that this country has been guilty of the late dreadful and disgraceful outrages of the rioters of the south, such as the burning of stacks, and the like, which fill the mind with horror and contempt, and such as could never happen among a peasantry duly educated in early life. [64]

A work compiled by Pitcairn, and other men of the Scottish bar, based on the "obscure annals of Scotland", showed the difference the progressive establishment of Scotland's parochial school system had made on that country's society. Before its inception in the sixteenth century, "the commonalty were of a description the most flagitious that could be met with in any nation of Europe" whereas, "the institution of parochial school masters produced a total change of the national character, for, during the last two centuries, this country has been held to be the most morally and orderly disposed of any in Christendom, and at the same time possessing the most general diffusion of knowledge."[65]

In concluding his discussion of the value of education, Blane wrote:

> Can it be seriously maintained that persons in their early non-age will lie in better condition as regards themselves and the community around them, by being left in a state of ignorance and prey to their budding prejudices, passions, and all manners of errors, moral and intellectual, grovelling superstition, and sensuality, than if the same minds were taught by instruction, habits, and examples to be made sensible of the advantages of industry over idleness, that 'honesty is the best policy', and above all, that most transcendant of all maxims, that of 'doing as we would be done by'. [66]

This emphasis on education in his last major work is a fitting conclusion to a dignified and successful career that had as its common

theme the value of educating people in all matters of direct concern to them in the hope, thereby, of effecting improvement in society and mankind. Whether it be the pamphlet he wrote for the officers of the West Indies Fleet teaching them how to increase the efficiency of their crews through improved medical conditions or his address to the public on the potential value of the smallpox vaccination for the whole of mankind, his emphasis was always on education. In this respect it can be seen that Blane's lifetime work was substantially directed by the influences of the Scottish enlightenment in his early years.

Throughout his lifetime Blane received numerous tributes to his work but perhaps the most prestigious was the Baronetcy he received on 26 December 1812.[67] Shortly after working for the government on the Walcheren Island affair, Blane began negotiating for his baronetcy. On the 2 November 1809, he wrote to Spencer Perceval (First Lord of Treasury 1809-1812) concerning this subject with the desire of supplementing the solicitations already made on his behalf by Lord Bathhurst, Foreign Secretary. "I shall now state at greater length the grounds upon which I found my claim to some special mark of His Majesty's favour and approbation." Among the 'grounds' listed were his thirty years of "public professional duties of the highest importance particularly in the Naval department". Elaborating upon his performance connected with the Navy he noted that,

> In the year 1805 it will appear from the correspondence of the Privy Council and Admiralty that it was recognized and admitted that the highly improved state of health of the Royal Navy was owing in a great measure to the various arrangements suggested and adopted from my writings and the regulations established during the seven years that I was Commissioner of Sick and Wounded Seamen. [68]

This letter did not achieve immediate results. By 19 March 1810, he still had not received his 'special mark' and so he wrote again to Perceval.[69] The situation was unchanged as late as 21 February 1812, that date finding Blane still gently prodding Perceval on the matter of a baronetcy.[70] Perceval did not object to Blane's continued attempts to solicit a baronetcy but it was not until Perceval's successor, the 2nd Earl of Liverpool, took over his position in June 1812, that Blane's hopes were realized.

Blane's health began to fail in 1821 but it did not seriously affect his lifestyle until 1834. In 1821 he was attacked by senile pruritus "which caused such distress that increasing doses of opium became necessary". In the final illness he suffered from oedematous and ulcerated legs. After 1822 he began to retire from public life, but as has been shown, he continued to play an active part in certain matters until the rapid deterioration of his health in the last years of his life. He died on 26 June 1834 at his house in Sackville Street, Picadilly.[71]

FOOTNOTES

1) Sir Gilbert Blane, Reflections on the Present Crisis of Publick Affairs with an Enquiry into the Causes of the Existing Clamours and Grievances (London, 1831), p.33.

2) Rolleston - 'Blane', p.80.

3) Royal Medical Society, p.44; Rolleston - 'Blane', p.73; DNB - Blane, pp.664,666.

4) Gentleman's Magazine, Obituary of Sir Gilbert Blane, Bart., M.D., F.R.S., January, 1835, Vol.106, p.93; Rolleston - 'Blane', p.74.

5) Ibid., p.73; Mathias, p.85.

6) Rolleston - 'Blane', p.74.

7) Allison, p.170; Rolleston - 'Blane', p.74; DNB - Blane, pp.665-666; A. Aspinall, ed., The Correspondence of George, Prince of Wales 1770-1812 (Vol. I-VIII), (London, 1963), Vol.I, pp.142,163; Vol.VII, p.224.

8) Ibid., Vol.I, p.256; Vol.II, p.81; Vol.V, p.518.

9) Mathias, p.80; Rolleston - 'Blane', pp.75,76; DNB - Blane, p.665.

10) Blane to Perceval, 2 November 1809.

11) DNB - Blane, pp.665-666; Blane to Perceval, 2 November 1809.

12) Letter from Blane to Sir Robert Peel regarding the honour bestowed upon Blane by the Royal Academy of Sciences of the Institute of France, 9 November 1826; Rolleston - 'Blane', pp.79-80.

13) Mathias, p.74; Rolleston - 'Blane', p.75; Letters to Lord Nelson from Office of Sick and Wounded Seamen of which Blane was one of

the authors as he was a Commissioner of this office on 26 March 1798; Letter to Lord Nelson from the Office for Sick and Wounded Seamen concerning a previous letter from Lord Nelson requesting lemons and onions, 3 December 1798; Letter to Lord Nelson concerning the conduct of one of his surgeons from the Office for Sick and Wounded Seamen, 23 June 1801.

14) Munk's Roll, p.327.

15) DNB - Blane, p.665; Rolleston - 'Blane', p.75; Blane, Reflections, p.79.

16) Mathias, pp.82-87.

17) Morris Berman, Social Change and Scientific Organization: The Royal Institution 1799-1844 (New York, 1978), pp.108-109.

18) Ibid., p.168.

19) Letter from Blane to W.M. Pitt concerning the state of Great Britain's Prisons, 24 November 1802.

20) Ibid.,

21) Berman, p.168; British Sessional Papers - House of Commons, 1823 Vol.V p.403, 8 July 1823.

22) Bristish Sessional Papers - House of Commons, 1824 Vol.IV p.475, 11 June 1824.

23) Sir Gilbert Blane, Inquiry into the Causes and Present Scarcity and High Price of Provisions (London, 1817), p.258; Sir Gilbert Blane, Inquiry into the Causes and Remedies of the Late and Present Scarcity and High Price of Provisions (London, 1800), pp.1-2.

24) William Petersen, Malthus (Cambridge, 1979), pp.39-40; James H. Treble, 'The Social and Economic Thought of Robert Owen' in

John Butt, ed., Robert Owen Aspects of His Life and Works (New York, 1971), p.28.

25) Blane, Inquiry (1800), pp.12,13,36.

26) Blane, Inquiry (1817), pp.282-283.

27) Ibid., pp.278,298.

28) Hildag Lundin, 'The Influences of Jeremy Bentham on English Democratic Development' University of Iowa Studies in the Social Sciences (Vol.VII, 1918-1921), p.48; Petersen, pp.118,136; E.P. Thompson, The Making of the English Working Class (London, 1963), pp.67-68,221-225; E.J. Hobsbawm, Industry and Empire (London, 1968), p.84.

29) Blane, Reflections, p.25; Watson, p.38; Blane, Inquiry (1817), pp.298,299.

30) Lloyd Jones, The Life, Times and Labours of Robert Owen (London, 1890), pp.2,87,90; Treble, p.21; Amy Margaret Gilbert, The Work of Lord Brougham for Education in England (Pennsylvania, 1922), p.1.

31) Blane, Inquiry (1800), p.66.

32) Ibid., pp.53,56,57.

33) Ibid., pp.68,69-70.

34) Blane, Select Dissertations, p.87; Rolleston - 'Blane', p.77; DNB - Blane, pp.665,666; Hansard, Vol.XV, 23 January - 1 March 1810.

35) Blane, Select Dissertations, p.87; Rolleston - 'Blane', p.77; British Sessional Papers - House of Commons, 1824 Vol.IV p.475, 11 June 1824.

36) British Sessional Papers - House of Commons, 1824 Vol.VI p.165, 14 June 1824; 1819 Vol.II p.537, 14 June 1819.

37) Gilbert Blane, "Regulations, proposed in the performance of

Quarantine at Standgate Creek in addition to those now subsisting and rendered necessary by the admission of Ships from the Levant without Clean Bills of Health", Royal College of Physicians, London - no date, p.1; Blane, Warning and Admonition, p.4.

38) Blane, "Regulations", pp.2-3.

39) Blane, Warning and Admonition, p.3.

40) Blane, "Regulations", pp.6,8.

41) British Sessional Papers - House of Commons, 1824 Vol.VI p.165, 14 June 1824.

42) Hansard, Vol.XII New Series, February-April 1825, 30 March 1825.

43) Letter from Blane to J.C. Hobhouse concerning the remarks made by the latter on the Quarantine Bill, 4 April 1825.

44) Robert E. Zegger, John Cam Hobhouse: A Political Life, 1819-1852 (Columbia, 1973), p.2.

45) Extract of a letter from Sir Gilbert Blane, Bart., to John Smith, Esquire dated 8 April 1825 and sent to Mr. Peel, 5 May 1825.

46) Hansard, Vol.XII New Series, February-April 1825, 30 March 1825; Hansard, Vol.XIII New Series, April-July 1825, 3 June 1825.

47) Paul Saunders, Edward Jenner: The Cheltenham Years 1795-1823 (London, 1982), pp.57,67,78.

48) Keevil, p.349; Sir Gilbert Blane, A Serious Address to the Public on the Practice of Vaccination (London, 1811), p.5; Select Dissertations, p.337.

49) Blane, A Serious Address, pp.6-7.

50) Ibid., pp.3,6-7,8.

51) Rolleston, 'Blane', p.77; Blane, Select Dissertations, p.334.

52) Ibid., p.337.

53) Ibid., pp.337,339,341.

54) Ibid., pp.341,353.

55) Rolleston - 'Blane', p.77.

56) Keevil, pp.349,350,351; British Sessional Papers - House of Commons, 1802 Vol.II p.267, 6 May 1802.

57) Rolleston - 'Blane', p.77; Saunders, p.107.

58) Blane, Select Dissertations, pp.354-355.

59) Saunders, pp.293,294,346.

60) Blane, Warning and Admonition, pp.1-3.

61) Ibid., p.3.

62) Rolleston - 'Blane', p.78; Blane, Reflections, p.4.

63) Ibid., pp.50-51.

64) Ibid., pp.50,51-52.

65) Ibid., p.53.

66) Ibid., p.55.

67) Gentleman's Magazine, p.93.

68) Blane to Perceval, 2 November 1809.

69) Letter from Blane to Spencer Perceval, concerning the possibility of Blane obtaining a baronetcy, 19 March 1810.

70) Letter from Blane to Spencer Perceval, concerning the possibility of Blane receiving a baronetcy, 21 February 1812.

71) Munk's Roll, p.327; DNB - Blane, p.666; Rolleston - 'Blane', pp.74,80.

CONCLUSION

This paper has focussed on Sir Gilbert Blane, not just as an individual, but as a representative of a wider transference of ideas from the Scottish Enlightenment to England in the late eighteenth century. His career has provided a useful focus for an examination of the impact of enlightened thought on the medical profession in Scotland and the eventual uses to which it was put in the Royal Navy and English society at large. It has been shown that through an enlightened education in Scotland, Blane had acquired tha basic intellectual tools characteristic of the enlightened period: an inquiring mind that searched constantly for means of alleviating human suffering and of allowing diverse strata of society to live more comfortably with one another, and an aptitude for systematic investigation nutured by some of the men who figured most prominently in the medical phase of the Scottish enlightenment (Dr. Cullen and William Hunter). By the time of his arrival in London, he was well prepared for a distinguished career.

As would be expected of a man educated in the enlightenment, Blane belonged to the school that believed in the 'perfectibility of man'. Perhaps his greatest contribution to English society lay in his awareness of the potential for reform and his endeavours to spread that awareness to as many people as possible. This greater awareness, which he believed would enable people to help themselves and reduce friction among the strata of society, was to be achieved through education; not just religious and moral, which were necessary parts of an individual's

life, but supplemented by an education in subjects essential to the individual's role in society and essential to particular issues affecting the individual. On a smaller scale education was a major tool he employed while in the Royal Navy to foster important medical reforms, and a tool he was to use after 1783 to inform society at large of the need of medical and other reforms. His view was that only by educating all interested parties in the need of any particular reform could he hope to have the reform implemented. Although he proved lacking as a clinical teacher, on a larger scale Blane was highly successful at educating people through his many written published works and correspondence.

While in England, Blane made full use of his enlightened education; rigorous empiricism was to be the basis of his success as a medical reformer in the Navy. Medical problems were investigated with a painstaking detail that aided in the implementation of reforms on a scale hitherto unprecedented, to the immeasurable benefit of his fellow man, and society. At a time when there were many conflicting theories concerning treatment of sea diseases, some coming from people in more prestigious positions, what was needed was detailed and accurate evidence. Blane enjoyed his considerable success with the Navy, particularly in the fleet of the West Indies, mainly as a result of his more rigorous observations though also as a result of his shrewd awareness of the exceptional financial burdens often thought by the authorities to be involved in reform. To assist in the adaptation of improved medical and hygiene standards within the Navy Blane always attempted to offset the financial burdens by showing how much more expensive it would prove to

be for the authorities to ignore the changes, in terms of replacing the lost lives of seamen and the cost of treating the sick, and by suggesting alternate ways of paying for the reforms - one particular option was the deduction from a seaman's wages of the cost of the service or item put at his disposal by the Navy. Blane also took care to present his reforms as being capable of producing spectacular results with a minimum of effort on the part of the authorities. The old adage that 'an ounce of prevention is worth a pound of cure' was evident in all the reforms Blane attempted to institute. His approach to the prevention of scurvy provides an excellent example of this. Using data collected from his rigorous observations, Blane was able to provide conclusive evidence that the use of the simple expedient of lemon juice, instead of just as a treatment in the cases of scurvy, could be put to the more significant use of preventing scurvy from even occurring. This usage, as he was quick to bring attention to, was far less time consuming and expensive than returning sick seamen to health.

His reforms for the fevers and fluxes reflected a similar interest in prevention, though in this case it was largely dictated by the inability of Blane and his contemporaries to determine the causes of the diseases. What he did recognize was the general preventive value of cleanliness: cleanliness of ship, person, clothing, food, water and air. To this end, he introduced means of attaining cleanliness at a minimum of cost and effort to the Navy. Soap for the personal use of seamen, although not introduced into the whole of the Navy during Blane's period, did gain much credibility under his guiding hand. Blane was also active in bringing into use means of cleaning ships which would

simultaneously ensure a dry atmosphere, a point considered by Blane to be as essential as the cleanliness itself. Other points he helped popularize were the use of air funnels for fresher air below decks and water cleaning systems capable of meeting the needs of a ship's crew for use in situations and areas where clean, clear water was unavailable. In this way, Blane hoped to achieve, and in many instances succeeded in achieving, reforms which satisfied all parties involved.

Further evidence of Blane's introduction of enlightened attitudes to the Navy lay in his efforts to reform the profession of naval surgeons. While in the West Indies, the surgeons were ordered at Blane's request, to keep more detailed records of specific diseases instead of merely records of surgery. These more detailed records, when combined by Blane, established a data base of more accurate observations of disease and sickness within the fleet. The information gleaned was then made available to all medical officers of the fleet as well as other sections of the Navy. Blane was also concerned to improve the status of surgeons within the Navy. He encouraged the Admiralty to improve the surgeons' position which in turn, he reasoned, would improve their self-esteem and render them more likely to work effectively, to the betterment of health care for the Navy's crews. It was to this end that he instituted the medals to be awarded to the two surgeons with the best kept record books.

A point that should be emphasized is the role of Admiral Rodney in Blane's initial success. It was due to Rodney that Blane was first placed in the authoritative position of Physician of the Fleet and it was due to Rodney's openmindedness that he was allowed to conduct the

experiments leading to his reforms. Much of Rodney's willingness to allow Blane a free hand in the medical affairs of the fleet was, however, a result of Blane's exceptional skill, knowledge and concern. Rodney had had an opportunity to reach an accurate assessment of Blane during Blane's role as his personal physician. Just as Rodney created an opportunity for Blane to make a reputation for himself, there can be little doubt that the position he acquired, as a result of that reputation, as physician to both the Prince of Wales and the Duke of Clarence, helped considerably to advance his career even further. The company he kept certainly influenced the success of his reforms; nevertheless, his skill as a medical man and the commonsense approach that he employed to further his reforms played a greater role in their success. Whether these factors were of greater importance in his success than the horrendous losses of seamen to disease that sparked the Admiralty into action is not easy to determine. It is obvious, however, that the accuracy of his observations and the conclusions he drew from them ensured that the benefits of his reforms were as great as he had forecast. The confluence of influence and time would have availed him little had he been wrong.

The reputation Blane acquired in the service of the Navy enabled him to expand his interests to cover a wider variety of civilian subjects and ensured that his views were listened to seriously. Kings, Presidents and departments of government were quick to consult him on a wide variety of subjects. His unusual role in the medical inquiry into the Walcheren expedition, his sponsorship of Jenner's vaccine, his ongoing role in the quarantine issue, his professional advice to the Select

Committee on Milbank penitentiary, all attest to his influence. These, combined with his writings on the scarcity of provisions, cholera epidemics and agrarian rioting in the south, attest to the wide variety of his interests. He was indeed a 'man o' parts'.

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