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W. Farr Esq. M.D., F.R.S., &c.  
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Friday, May 27th, 1859.

Colonel the Hon. JAMES LINDSAY in the Chair.

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THE APPLICATION OF STATISTICS TO NAVAL AND  
MILITARY MATTERS.

By W. FARR, Esq., M.D., F.R.S., &c.

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§ I.

If a discovery is made in chemistry—if a new power, such as steam, is created—if new arms are invented—if new systems of preserving health are discovered—military science naturally endeavours to turn them to account; and often succeeds to an extent which the inventors never anticipated.

It was, I apprehend, from a belief that the field of statistics might contain materials of value in a military point of view, that the Council of this admirable Institution requested me to deliver a lecture. And I hope to be able to show that, however wrong they were in the choice of a lecturer, they were right in the selection of a subject.

Statistics is almost a new science. Its name is scarcely understood; yet it has been prosecuted diligently for many years. A great number of facts has been collected, and new methods of inquiry have been instituted. The Census supplies information about the population of these islands in the present time; and thus it furnishes some indications of the resources and the strength of England. The wealth of the country—its sinews of war—has also been investigated. The means of determining the loss of life under different circumstances are known; and many of the causes of sickness and of death are understood. Financial statistics, and all the methods of estimating and of checking expenditure, have made immense progress since the last great French war.

Numbers enter largely into the striking results of war; they run through all its combinations; victory, liberty, the happiness of families, and the fate of nations, often depend upon subtle calculations.

I propose to pass rapidly in review some statistical facts, which may probably be turned to account by some of you, in increasing the power and in developing the defences of this country.

Military statistics deal with the sea and the land forces. The land force consists of the standing army, in the first place; and, in the second, of the yeomanry, militia, and volunteers, which may be either a regularly disciplined force, or a large temporary levy of the fighting men of the nation.

Adam Smith, in one of the ablest chapters of the "Wealth of Nations,"\* shows that "a well-regulated standing army is superior to every militia." And, undoubtedly, if the choice lay between these two institutions, it must fall on the standing army; to which the facts I shall have to discuss will refer. But the two systems of defence are required; and the utility of the combination of a standing army—of a military profession—with a well-organised militia, is established by experience, and by the highest military authorities. By the combination, many of the advantages of both the systems are realised, and the evils of a large standing army are avoided. The militia is, says Jomini, the auxiliary of the army on great occasions; and this simple institution, which places all the fighting men of a nation in local reserves, and in battalions ready organised, partly trained, and acquainted with the use of arms, admitting of development in proportion to the dangers of the country, is certainly as suitable to the character of the English as it is to the character of any other nation.† It is an old English institution; and our Census shows to what extent it can be developed to meet the exigencies of the times.

The militia was almost extinct at the time of the Census. I say nothing of the non-effectives, which amounted to 83,797 in the year 1851, when the effectives were 178,773, making the army and navy 262,570 in the aggregate, of which more than two-thirds were serving. And I omit all the forces in the service of the East India Company; the European part of which would raise the effectives of that year to about 203,807.‡

The following are some of the statistical characteristics of the army and navy. They show how the military differ from other professions. I refer to tables in the Census Report (1851) for the facts. §

(1.) These professions are followed by men only.

(2.) They are followed by men of certain ages; and, although a few are in the returns under 20 and above 40 years of age, the great bulk of the men are of this age, which may be called the athletic age. "It is the age of early manhood. The growth is then completed; weight, stature, and strength are at their maximum." Of 178,773 effectives,

MALE POPULATION of UNITED KINGDOM and ARMY and NAVY at  
DIFFERENT AGES.

Age.	Male Population of the United Kingdom, 1851, at six different ages.	Army, Navy, and Marines, belonging to the United Kingdom, 1851.
10	1,600,554	879
15	1,494,019	17,351
20	1,268,129	62,364
25	1,084,332	48,282
30	939,525	28,382
35	818,460	13,399

\* Book v. ch. i. part 1.

† Jomini, vol. i. p. 222.

‡ Census, 1851, Occupations, &c., vol. i. p. cccli.

§ *Ib.* vol. i. pp. ccclv-viii.

including officers, 8,116, or only *one* in 22, were of the age of 40 and upwards; 299 were of the age of 60 and upwards.

(3.) Their numbers fluctuate to an extent unparalleled in other professions. Since the Revolution, the sea and land forces have so fluctuated, as to range from a given number in time of peace to *four* times that number in war, and shortly after the peace back again to the original number.

(4.) *They are unmarried* to an extent of which there is no example—at the corresponding ages—in other professions. At the age 20–25, *twenty* per cent. of the civil population are married. At that age 4 per cent. of the officers of the army, 2 per cent. of the officers of the navy, 5 in 100 soldiers, 6 in 100 seamen, are married.

At the age 30–35, *seventy-one* per cent. of the male population are married; of officers *half* this number, or 35 in the army, 44 in the navy, are married; of the soldiers 28, sailors 47, are married.

Officers in the army marry in larger proportions after the age of 40, but never in the same proportion as men in other professions; after the age of 40 however naval officers excel other professions in this line; from 78 to 84 in 100 of them are living in matrimony at the age 40–60.

Sailors of 45 marry to nearly as great an extent as other professions; the soldiers reach this haven later, so that at 50 and upwards an unusual proportion are married; of the conjugal condition of the ineffectives we have no information.

(5.) The mortality of the army is at the rate of 32 in 1000 in time of peace.\* It was, excluding officers, at the rate of 56 in the last French war. The mortality of the civil population at the corresponding ages is at the rate of 9 in 1000. The excess of the mortality in the navy was formerly as great; it is at present much less.

(6.) A considerable part of the excessive mortality is the result of defective sanitary arrangements at home and abroad, and a part is also referable to climate, for it is one of the characteristics of our military force that it is in a state of perpetual movement. In 1851, of the Queen's army, 66,424 were at home, 76,446 were in the colonies, in India, or on the passage out or home.

(7.) The regular forces of a country may consist of foreign troops, or of natives; and, as every great country contains more than one race, the constituent ratios of the several races may differ. England contains men of Irish, Welsh, and Highland blood, as well as Anglo-Saxons and Normans. It is a mistake to talk of us as simple Anglo-Saxons. The English army, like the nation, is a fusion of all these kindred races. The numbers born in England (67,647) are nearly equal to the numbers born in Scotland (15,300) and Ireland (53,169) together (68,469); of the officers, 4,000 were born in England, 836 in Scotland, 1,670 in Ireland. Only 6,754 men of the English army had foreign birthplaces. The royal navy contains few Irishmen; of 35,903 seamen and marines, about 23,401 were of English, 9,466 of Scotch, and 3,036 of Irish birth. Taking these numbers, there were enrolled in the regular forces 91,048 Englishmen,

\* Mortality of British Army, p. 10.

† Estimated from the Returns of Seamen, Census, Occupations, &c., vol. i. p. cccli. Proportions: English '66; Scotch '26; Irish '08.

56,205 Irishmen, 24,766 Scotchmen, and this is in the order, but not in the proportion, of the three populations. England, Wales, and the Channel Islands contributed 50 in 10,000 of their population; Scotland 85; Ireland 86; the United Kingdom, which, for the sake of brevity, may be called England, 62 in 10,000 of the population. There is sufficient variety to supply the peculiar qualities suitable to cavalry, infantry, and artillery on land, and seamen on the ocean; while all races, speaking one language, enjoy the same rights, and are indissolubly united by past victories and present liberties. The population of none of the great powers—nay not of France herself—has a firmer solidarity.

Now it follows, as a necessary deduction from what has been said, that the *ARMY and NAVY are NOT SELF-SUSTAINING*, and, if they were not constantly recruited from the other professions, the race of British warriors would become extinct. The families of other professions reproduce themselves, and are constantly increasing at home, as well as sending out swarms of emigrants abroad. But it is evident that, if the mortality of the army be undiminished, though the soldiers brought up as many children as the men of other classes—which could only be the case if *four times* as many were married as are married at present—the sons would never equal the fathers in number. Judge then of the state of things under the existing system. Officers cannot often be the sons of officers; soldiers are not the sons of soldiers.

This makes recruiting, which in other professions goes on of itself, a problem of vital interest in the army. It is a difficulty which meets you at the threshold.

If you look into the system of recruiting in other professions, you will see how this difficulty, and another almost equally great, are overcome. The landed gentry do not die out. The troops of artists, clergymen, lawyers, and physicians are easily kept up; the sons always equal the fathers in numbers, and, should the supply fail, the sons of other classes always flow into the ranks. These professions offer honourable and, on the whole, attractive occupation to men. But take other classes: the 159,073 tailors are maintained without any difficulty; the sons replace the fathers. The 282,897 shoemakers are never at fault for successors; the sons replace the fathers. And if there is an extra demand in any of the trades, a rise of wages soon draws into the ranks the required number of the sons of other artisans. The great army of 659,765 farmers, and their men 2,146,936 strong, gets its recruits silently; for the sons replace the fathers.

In this kingdom there are now more than 301,253 miners. The occupation is by no means attractive. It is hard, dirty work, pursued under ground. You see the collier at the coal seams nearly naked, covered with perspiration, in his ordinary employ. The danger in many mines is great. The men are knocked on the head by the fall of coals; they are often burnt; or they are blown up in great numbers. The mortality of miners from violent deaths alone in Staffordshire and in Wales is at the rate of 8 in 1,000 annually;\* in Cornwall the mines are so badly ventilated,

\* The army at home and abroad lost less than 7 in 1,000 by injuries in action during the wars, 1793—1815. See two excellent papers, by Mr. Hodge, in the Journal of the Statistical Society, vols. xviii. xix.

that the constitution of the men is destroyed in early life. The miners are nevertheless recruited without difficulty. The wages are 3s. 4s. 5s. a-day in Staffordshire, and the men work five days of the week. They marry young in great numbers, and bring up to their business sons whom they send down to the work early in life; you will see how early by this statement:—

	Aged 10—	Aged 15—	Aged 20—	Aged 25 to 30—
Miners . .	35,518 . . .	51,064 . . .	51,302 . . .	40,398

I met in the districts boys who had lost their legs, and been otherwise mutilated in the mines.

Upon asking an excellent man in Staffordshire, who had many boys in his employment, why they were sent down into the pits so early, he replied:—"Unless they go down at an early age, they will not go down at all."

In all disagreeable trades, the wages are raised; the families are multiplied, and the boys are sent to work at an early age by their parents: for boys do not really choose their profession; it is chosen for them. The agricultural and mechanical occupations of the country are all entered before or shortly after the age of 15. So that when you ask for recruits for the army later in life, you ask them to leave some other profession. The country, with its vast dependencies, requires a regular force for its defence. Whether the strength should be 100,000 or 200,000 officers and men, is it not desirable that the class should breed a considerable number of its body? Valour is transmissible. This is an elementary principle in physiology.

Fortes creantur fortibus et bonis;  
Est in juvenis, est in equis, patrum  
Virtus.

A perpetual class of men is required: by removing the obstacles to marriage, lightening the lot of soldiers' wives, and facilitating the education of their children, you sustain their numbers in the most natural way.

We know what encumbrances—real *impedimenta*—wives and children must be in a moveable force. But human passions cannot be suppressed; soldiers have their affections like other men. And if they have not wives, other women we know surround all camps. Half the sickness probably which disables so large an amount of our forces at home springs from such sources; and it unfortunately happens that the children of the "black-eyed Susans," and of the "girls left behind him" by the soldier, die in wretchedness or live fatherless.

*Enforced celibacy* in any large class necessarily undermines public morals; and ends in the destruction of States. The Romans, after their eastern conquests, expressed a general disinclination to marriage. The Senate in vain passed marriage laws; in vain Augustus reproved and exhorted his officers to marry, and perpetuate the Roman name. The women, descended from the Lucretias of the Republic, became the Messelinas of the Empire; and the legions, having died out, had to be replaced by the descendants of those virtuous Germans celebrated by Tacitus.

Upon all these grounds the restraint of marriage in standing armies appears to be impolitic; it produces disease, it forces corruption, and it cuts off a natural supply of recruits.

Under any circumstances however, a large portion of the recruits must be drawn from the general population. And it is evident, from what has been said, that recruiting is easy in proportion as you take boys at the early ages. There were 1,268,129 men in 1851 of the age of 20 and under 25, of whom 62,364 were in the army and navy. There were 1,494,019 boys of 15 and under 20 in the kingdom; and if the analogy of the mining class were followed, an equal number of them would be enrolled. That is, if you had 62,364 soldiers of the age 20-25; you should have 62,000 soldier-boys. But "boys are unequal to all the duties." Undoubtedly. All our industrial operations are now scientifically subdivided; and thus a part of the processes is performed by the most skilful men, a part is performed by machinery, a part by brute muscular force, and a part is performed most effectively by boys. In Staffordshire, the labour of the young hands is highly valued; at the age of 15 they get 2s. a-day, five days in the week.

The dexterity necessary for delicate mechanical operations is acquired early, before the bones are thoroughly set, and the development of the muscles is completed. No one can learn to handle a tool well unless he take it up early. The fiddle cannot be played by people who have not practised from childhood. And do not the arms of the present day require in use a quickness of the eye and a precision of the hand which nothing but early training can impart? You have the great divisions of the army into officers and men, as well as into the different arms; and it is a question for military art to decide whether, by some further subdivisions, profitable employment may not be struck out for boys of 15; although the main work may still be performed by men.

In the merchant service there were 30,987 boys of 15-20, to 39,888 men of 20-25; in Her Majesty's navy, the boys of 10 and under 20 amounted to 5,225, while the men of 25-30 were only 5,567. Probably more able seamen are formed by this arrangement than would be obtained by taking them at 18 into the navy. The majority of our unmatched seamen must have gone to sea as boys, and is it not certain that if the army were entered at the same age the men would attain the same marvellous efficiency?

You have the recruiting of the peace establishment, and you have the recruiting of the forces when the country is at war with France; the wars with other powers being always of comparatively small dimensions. What force can this country raise? We have the analogy of 1811, when the power of England was fully developed; and if we assume that the forces raised should bear the same proportion to the men of the age of 20-40 as they bore in 1811, then the numbers would be 817,229 men.

This was the nature of the force in 1811:



## SEA and LAND FORCES of the UNITED KINGDOM.

(See Registrar-General's Sixteenth Annual Report, Appendix, p. 123.)

		Proportion in 1811 to 100 Males living, aged 20—40.	Military and Naval Forces in in 1811.	Military and Naval Forces in 1859, if the Numbers were in the same propor- tion to the Males aged 20—40 as in 1811.
Sea and Land Forces . . . .	(1)	19·5	501,488	817,229
Navy—Seamen and Marines . . . .	(2)	5·3	136,773	222,895
Army—Cavalry, Infantry, and Artillery . . . . .	(3)	14·2	364,710	594,334
Army and Navy:—				
Native Force . . . . .	(4)	17·2	441,603	719,640
Foreign and Colonial Force . . . .	(5)	2·3	59,885	97,589
Army:—				
Regular Force, Native and Foreign	(6)	10·7	276,189	450,080
Regular English Force . . . .	(7)	9·1	233,636	380,816
Royal Troops in India . . . .	(8)	1·2	30,253	49,300
At home and abroad (exclusive of Forces in India) . . . .	(9)	7·9	203,433	331,516
Embodied Militia . . . . .	(10)	3·5	88,521	144,254
Foreign and Colonial Troops . . . .	(11)	1·6	42,503	69,263
„ „ Seamen . . . . .	(12)	·7	17,382	23,326

$$\begin{aligned}
 (1) &= (2) + (3) & (3) &= (7) + (10) + (11) & (6) &= (7) + (11) \\
 (1) &= (4) + (5) & (4) &= (2) + (7) + (10) - (12) & (7) &= (8) + (9) \\
 (1) &= (6) + (2) + (10) & (5) &= (11) + (12)
 \end{aligned}$$

It will, I believe, never be wise to embody such a number of men, but *it is in the country*, and, if required, can be produced as easily as the force in 1811, either as a volunteer force, a militia, or a regular force.

## § II.

The power of this country at any given time depends upon the genius of its commanders, the skill of its officers, and the courage and character of its men, more than on the numbers of its population; but, other things being equal, population and power increase together. I will now trace the development of this force. Julius Cæsar first landed in Britain with 12,000 men, and was glad with his fortune to disembark. In his second descent he had 2,000 horse and 5 legions. The Roman

army which conquered Britain was composed of some 50,000 men, and the mutual dissensions of the natives facilitated the conquest. Harold had at Hastings about 60,000 infantry; William fought with the same force, but it consisted of the three arms, and had its due proportion of cavalry and archers—the artillery of that day. After the Conquest, the kingdom was held securely; there was a baron, or military chief, and a strong post in every manor of the country, surrounded by, perhaps, 60,215 knights, in the possession of as many portions of territory. The population of England at that time has been estimated at *two millions*.\*

By the Statute of Westminster (13 Ed. I.) every man between the ages of 15 and 60 was to be assessed and sworn to keep armour to the value of his lands and goods. These were the fighting men. Boys of 15 were then accounted fighting men. But this force was only called up for short times, and the feudal service was limited to *forty* days, beyond which the knights could only be retained by their own consent, and at the king's expense. The bow-men, like Robin Hood's men, often owned no fees, and owed no service.

Edward III. in his great wars with France first tried two campaigns with mercenaries in Flanders. His attack failed completely, and he incurred large debts. The population of England and Wales amounted then to about 3,000,000. After the English had destroyed the French fleet, he collected a force of 30,000 men, and landed at the Hogue on July 12th, 1346. Normans, Saxons, and Celts were blended together: for that force consisted of 4,000 men-at-arms (Normans), 10,000 archers (Saxons), 10,000 Welsh infantry, and 6,000 Irish soldiers. With this army the battle of Crecy was fought, and the glorious victory consecrated the fusion of the races. Mr. Hallam remarks:—"Edward III. and his successors, in their long contention with France, resorted to the mode of recruiting by contract with a man of high rank or military estimation, whose influence was greater probably than that of the Crown towards procuring voluntary enlistment. *The pay of soldiers*, which we find stipulated in such of these contracts as are extant, was *EXTREMELY HIGH, but it secured the service of a brave and vigorous yeomanry*." The population of England further increased, and Henry V. levied an army and landed in Normandy on August 1st, 1417, at the head of 30,000 men, namely, 6,000 men-at-arms, and 24,000 foot, mostly archers. With this force, reduced to about 9,000 by dysentery, the battle of Agincourt was fought on October 25. In the following year he landed in Normandy at the head of 25,000 men, which was reinforced by 15,000, making 40,000 in the aggregate. In 1421 he levied a new army of 24,000 archers and 4,000 horsemen. These armies gave him the daughter and the crown of France.

Machiavelli deduces this lesson from our history.† "There is nothing more certain than that, where men are unapt for war, the fault is in the Government; of which," he says, "we have a fresh and memorable example. There is scarce anybody ignorant, that of late years the King of England invaded France, with no soldiers but his own people; and yet, though England had had no wars for thirty years, and had neither officer

\* Census, I. Report, lvii.

† Discorsi, i. 21.

nor soldier who had ever seen a battle, he ventured to attack a kingdom full of officers and good soldiers, who had been under arms for several years together in the Italian wars. This proceeded from the prudence of the Prince, and the excellence of the Government, in which, *though in times of peace, the exercise of arms is not intermitted.*"

The army was a militia: yet the victories were not accidents. The order of battle—the same at Crecy and Agincourt—was, it is said, an improvement on the formation of Hannibal at Cannæ: the conduct of the kings in command and of the troops was excellent; and the archers had had bows in their hands from boyhood. They did not begin to use their weapons for the first time at the age of twenty.

The "fighting men" were enumerated in Elizabeth's reign, and amounted in 1583 to 1,172,000, which would imply that the population was about 4,445,400. All the seamen in England amounted to 14,000; the land forces amounted to 79,000, at the time of the Armada.

Up to the reign of her successor, Scotland was frequently at war with England. Next to France, she was the most constant adversary. The King of England—

Never went with his forces into France,  
But that the Scot on his unfurnished kingdom  
Came pouring, like the tide into a breach.\*

The crowns were united in James; and the population of England, about 5,466,000 in 1651, became 6,378,000 by conjunction with Scotland; but in this year of Cromwell's "crowning mercy," that country was garrisoned by his troops. The union was in fact first completed by the genius of Chatham, who placed arms in the hands of the Highlanders.

Blake, in the command of thirty ships, entered the Mediterranean Sea, where no English fleet, "except during the Crusades, had ever before sailed." And the army "never failed to destroy and break to pieces whatever force was opposed to it."† Under Turenne, the English troops beat the famous Spanish infantry, and took Dunkirk. The army which proved invincible was not large; but it had a peculiar character. "*The pay of the private soldier was much above the wages earned by the great body of the people; and if,*" says Macaulay, "he distinguished himself by intelligence and courage, he might hope to attain high commands. *The ranks were accordingly composed of persons superior in station and education to the multitude. These persons, sober, moral, diligent, and accustomed to reflect, had been induced to take up arms, not by the pressure of want, not by the love of novelty and licence, not by the arts of recruiting officers, but by religious and political zeal, mingled with the desire of distinction and promotion.*"

The army and navy assumed unusual dimensions during the reign of William III.; 40,000 seamen and 87,702 men under the head of land forces, were voted in 1694; and as supplies, £2,382,712 were voted for the navy, £2,500,000 for the land forces. While the seamen remained at 40,000, the land forces voted during Marlborough's campaigns were, on

\* Shakespeare, Henry V. Pope Martin V. said: "In truth the Scots are the only antidote of the English."—P. Hist. of Eng. ix. A. D. 1421.

† Hume; Macaulay.

an average, 50,000, and never exceeded 65,210. The British force at Blenheim did not apparently exceed 9,000; and throughout the war, their "valour and order" appear to have been more striking than their numbers. "The troops," Marlborough writes in 1708, "are in so good a condition that it would gratify your Highness to see them."\*

The power of England increased slowly, and after the peace of Aix-la-Chapelle, in 1751, the population was about 7,392,000. In that year Clive marched from Madras at the head of 200 Europeans and 300 sepoy to Arcot, and the English became subsequently masters in India. The seven-years war followed, in which Prussia, allied with England, fought France, Austria, and Russia; and Spain also engaged in war against England. 70,000 seamen, including 19,061 marines, and a land force of 77,046, in all 147,046 men, were voted; the supplies for that year (1761,) were £3,912,226 for the navy, and £1,793,033 for the army. The naval force of England was chiefly engaged; but Wolfe's victory led to the cession of Canada by France, and of Florida by Spain, at the peace of Paris in 1763. The after-loss of the American Colonies—the cession of Florida and Minorca to Spain, of Senegal and the French East Indies, were the result of the great war with the United States, France, Spain, Holland; and of the armed neutrality. The population at that time could scarcely sustain the position England had attained. The new manufacturing arts, and the mines, created a demand for skilled labour; wages rose, and the army low pay drew only an inferior class of men into its ranks. Their inferiority in the use of projectiles, which had been the glory of English troops, was evident in the American war, and in the early wars of the French Revolution, where ignominious failures were not wholly the fault either of incapable generals, or defective sanitary measures.

That the people of Ireland were alienated from England by commercial jealousy and bigoted intolerance, we are reminded by such events as the battle of Fontenoy, the Irish volunteers, and the Rebellion of 1798. The Union did something to heal the breach in 1801, and the good work has since been completed. The population of the *United Kingdom* amounted at the Union to about 15,957,000, and it grew during the ten years of war to 18,221,000 in 1811.

To recapitulate: when Edward III. invaded France, he had about 3,600,000 subjects, English and Irish. When Queen Elizabeth encountered the Spanish Armada, she was at the head of 5,000,000. When Cromwell asserted the power of England in Europe, and Blake's flag swept over the Mediterranean, of the 7,470,000 people in these islands, 2,000,000 at least in Scotland and Ireland were hostile to the Government. George III. in the war which the great Chatham directed, drew his forces from 9,742,000; and now Queen Victoria reigns over 28,000,000 people, of whom 4,238,000 are of the military age; or if you go back to the age of 15, and take the old definition, 8,000,000 are fighting men. On the standard of 1811 she can cover the seas and maintain in the field for many years a force of *eight hundred thousand men*. I leave out of account the force of the Colonies and India.

The population of the other great powers of the world has also rapidly increased: Russia has conquered all the parts of the Northern hemi-

\* Despatches, vol. ii. p. 243, June 11, 1708.

sphere except the valiant states of Sweden, Norway, and Denmark. The great powers of Prussia and the United States of America have increased more rapidly than England. The population of France was to that of England as 27,000,000 to 16,000,000 in 1801; it is now as 36,000,000 to 28,000,000. These numbers are nearly as 17 to 10, and 13 to 10 respectively. France, notwithstanding the great outlet for population in Algeria, has seen little increase of her children recently; and in 1851 the number of English children under five years was greater than the number of French children. Frenchmen of the age 20-25 are now nearly 1,523,000, and Englishmen of that age are 1,508,000. The numbers at the conscription age are nearly equal. So much for the power of England estimated in men.

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### § III.

I have now to notice some points in war finance, which can be illustrated by statistics.

Adam Smith lays it down that "*the whole army and navy are unproductive labourers*. Their service," he says, "how honourable, how useful, or how necessary soever, *produces nothing* for which an equal quantity of service can afterwards be procured."

What have we to say in reply? Shall we enumerate the glorious victories which illustrate English history? Unfortunately political economists see few charms in military glory. They count the cost, and remind us of the destruction of property and life in war.

Shall we enumerate the British possessions which have been acquired by the vigour of successive Governments and the valour of the army and navy? British North America, the West India Islands, the fortresses in the Mediterranean, the islands in the Atlantic, the points on the west coast of Africa, South Africa, the small islands in the Pacific, New Zealand, Australia and its gold mines, Hong Kong, India—making 7,895,000 square miles of territory, some of it fertile in the highest degree. That is something solid. But *colonies do not pay*, exclaim the economists. They will not pay even for their own defence. The American colonists began a great war with France, and *rebelled, because they were called upon to pay a fraction of the costs*.

Upon looking at the matter more closely, it can however be demonstrated, upon the principles of political economy, that a defensive force is productive in the true sense of the word. Take the navy. The seas are now covered with British merchandise. In the trade-returns, the value of the exports is set down at £126,000,000; the value of the imports at £192,000,000.\* Ships are insured, and the other day the mere rumour of war raised the rates of insurance. Insurances, Chalmers says, were never, except in peace, made on such reasonable terms as in the last war—"after the capture of the enemy's corsairs and the ruin of his fleet." Insurances, I suspect, would run up now very rapidly, if England had no fleet. Perhaps some of the powers which have fleets might find out satisfactory reasons for sequestering our merchantmen: and if all nations suppressed their fleets, the

\* £4,508,000 transhipped appearing in both.

seas would be covered with swarms of pirates. The insurances to cover losses would then exceed the expenses of an adequate navy preventing losses, if trade were carried on; but trade would be, in such a state of things, impossible.

It is not an easy matter to estimate the value of property in the United Kingdom; but if we capitalise the value of the labour, and include the property, it cannot amount in the aggregate to less than £10,000,000,000; and the value of the annual produce probably exceeds £400,000,000. The possession of that property is secured against foreign aggression by the army and navy. The property is now insured for £48,000,000 a-year, including the charge on the war debts, that is, at a premium of *five farthings* on the pound, or a little more than 12 per cent. on the produce.

The British dominions abroad, exclusive of India, are *fifty-five* times as great in extent as these islands. What the value of the property is to the colonists, I do not pretend to determine; but if the protection of the British flag were withdrawn, colonial property would be in imminent jeopardy; and it owes its security to the army and navy. England protects her colonies, almost as a father protects his children at her own expense. Some of them are approaching, and will, we may hope, soon attain, their majority. They will be able to defend themselves, with some assistance in extraordinary emergencies.

Labour is required to create property; and property loses all its value if it is destroyed. The labourers require protection in carrying on their work; and the owners must be secured in their possessions. This service is absolutely required; it is therefore obtained, and paid for like other labour, which is of no more than equivalent value. Any expenditure on an army exceeding the sum required to secure the life, property, and freedom of the people, is, I admit, entirely unproductive; and this view deserves the attention of the continental monarchies.

It is then evident that as much military force as is required to defend a country is productive; and the value of the product is expressed economically by the *rate of insurance indispensable to maintain the security it affords*. Our forces may be legitimately employed for other purposes than defence against attacks. They may be, in my opinion, employed in the support of any righteous cause which can only be promoted by arms. But England, as Hume acutely remarks, is ever too ready to engage in war, particularly against her great rival; and this is turned to account by continental diplomatists.

In the six wars since the Revolution (1688) England, besides the sums annually raised, contracted £802,000,000 of debt. The amount of the debt is now £803,000,000; the annual charge, £27,412,000. The wars with France last, on an average, 11 years; and the three wars from 1793 to 1815—which were really one—extended over 22 years. Such are the resources of these two great states. The amount of debt contracted in every war increased: in the four last wars the debt contracted was 31, 64, 121, and 529 millions. It was doubled twice, and then quadrupled. I am afraid to announce the next term of this progression. And I hope it is unnecessary; as, if the country engage in a just European war, let us hope that our statesmen will appeal to the patriotism of the people for a large portion of the supplies within the year;

and adopt measures to prevent the waste which was exhibited in raising and expending the public money in former wars. Then England, adopting a wise economy, will meet with no difficulty in procuring the "guineas" which Jomini holds are so great an element of her strength. For she paid for the supplies of her army, not only in Spain, but in France itself; and has yet met every one of her engagements since the Revolution, while the other great powers have several times been bankrupt. France repudiated a great part of her debts five times in that period, and once under Sully. "Thus," says Bresson, one of the latest financial writers, "the public faith has been broken six times in two centuries; each generation has seen a national bankruptcy."\* Punctuality in meeting her engagements is the explanation of the credit of England, which some continental writers, strangely enough, regard as a "secret."

War has led heretofore to the greatest waste of the national resources, not, be it remarked, to the profit, but to the loss of the army and navy; and in the last European war immense sums were thrown away. There was no proper audit; and only a very imperfect publication of the accounts, both of men and money. In the present day the financial accounts go a great deal into detail; but, as statistical documents, they are exceedingly imperfect. The items require judicious classification. The number of officers and men voted appears in the estimate, but where is there any account of the men actually serving? The items of income and expenditure appear, but there is an immense durable stock of ships, timber, wares, clothing, forage, barracks, and warlike stores, which never enter into the annual accounts; when this stock is consumed the annual expenditure is apparently low, and we have what the simple call "a model year;" when it is augmented, as in the present day, the expenditure is made to appear higher than it really is. To present a true account, *stock should be taken at the beginning of every year*; and the public accounts would then become reliable statistical documents.

If we divide the total expenditure on the army, navy, and ordnance, in the year 1811 by the mean strength, it is found to be at the rate of £112 a man in the currency of that year, or £97 in gold. The cost in 1851 was nearly at the same rate, £99 per man. Owing to the operations on the stock, the value of which does not figure in the public accounts, the expenditure, £21,143,000, divided by 176,906, the number of men, gives the higher rate of £118 per man for the financial year 1859-60. The expenses of warlike stores, and of their manufacturing establishments, should be distributed equitably between the army and navy; but in what proportions I cannot learn. I divide the expenditure under these heads into two equal parts for the moment; and the figures stand thus, after excluding the troops on the India establishment:—

	Officers and Men.	Expenditure by Estimate.
Army . . . . .	117,906	£10,678,000
Navy . . . . .	62,000	£10,465,000

The annual expenditure in the army, including every item, is £91 per man; in the navy, £169. This includes the pay of ineffectives, who are maintained for the sake of the effectives.

\* *Histoire Financière*, par J. Bresson, tome ii. pp. 439-41

A correct statistical account would show the amount and value of every kind of store, and the expenditure per man in the several regiments and ships. The Government could thus exercise an effectual check on the expenditure.

The wages and victuals of officers and men in the navy amount to £56 per man, or one-third part of the aggregate expenditure. To secure their services they are promised half-pay and pensions, which they will one day enjoy; this item of expenditure makes £19 a-head. The ships and establishments cost £64 per head; and this year £16 extra for building and conversion; the warlike stores and their artificers £14 a-year, if half the ordnance charge belongs to the navy.

I wish to direct your attention to two points in *army* finance. The expenditure is at the rate of £91 a man, or, exclusive of the pensions and half-pay, is £72 per man. The pay and money allowances are £32 a man; provisions, fuel, light, clothing, necessaries, £9 a man; barracks £7 a man; equal to £48 a man. This includes officers.

If we separate the officers, their pay on an average is £233 for each officer, exclusive of half-pay and retiring allowances. The pay, allowances, clothing, medical attendance, necessaries, and barracks of the non-commissioned officers and soldiers, amount on an average to £29 8s. a-year; add £5 as the equivalent in present pay of the contingent pension, and the soldier's pay is £34 8s. a year, or 13s. 3d. a week. Whether the soldier be inefficient from sickness or natural incapacity, whether he be weak or strong, dull or quick, stupid or intelligent, all the items of expenditure, except pay, must be the same; and in war the losses by the failures and defects of sick, feeble, incapable, unintelligent armies are costly, and may be irretrievable ruin to their country.

The first economy which statistics have shown is practicable in the British army is *economy of life*: the mortality is much higher than the mortality of the civil population at the corresponding ages, not only abroad but at home. The causes are known, and they can often be removed. It is the same with sickness. Of the British army in the Peninsula 9,300 out of 44,500 (21 per cent.) were constantly sick. The mortality in the army of the East was at the rate of 26 per cent. of which 20 per cent. was by disease; the sickness was in the same high proportion. The sickness and the mortality were formerly as high in the navy; they have been reduced at sea, and they can be reduced by land. The statistical labours of Mr. Marshall, Mr. Edmonds, Mr. Hodge, Sir Alexander Tulloch, and Dr. Balfour, and the inquiries which have been conducted by Commissions and Committees, over which Mr. Sidney Herbert has presided with indefatigable zeal, and with remarkable ability, show how the army might be made a comparatively healthy profession for good men in the prime of life.

Great economy in the end will be realised in the army by the introduction of good arms. And our military history shows that still greater advantage will arise from inducing good men to handle those arms; the legitimate inducements being, in this as in all other professions, good treatment and adequate pay. What is adequate pay? I make one or two observations on this matter, because the pay of the army—unlike that of the navy—cannot be regulated by the competition of a convertible pro-



profession analogous to the merchant-seamen. I have several returns of wages; but it will be sufficient to mention that, while the class of labourers earn 18*d.* a-day, or 2*s.*, a large class of miners and artizans gets 4*s.* a-day; carpenters and masons get now 5*s.* a-day at Greenwich Hospital; some of our highest classes of artizans earn 7*s.* and 10*s.* a-day. This is of course exclusive of Sunday. Their work is not always constant, and they get no pensions. Apprenticeships are served in many of these trades; which, as I have shown, are all entered early. Now the pay and treatment which will draw the sons of men of these classes into the army can only be determined by experience. But it appears to me that you will, for the future, have to pitch the pay of officers and men on a higher than the present scale, to compete successfully for the best men in the field; that you must take many boys at ages as low as fifteen; that you must have different classes of men, at different rates of pay; and that you must abolish all such interference with the men as the forbidding to marry, which is, in the eyes of every man, a grievance, and is probably actually injurious in various ways. The army will thus be a profession, honourable down to the lowest ranks; and a prudent father may recommend his son to enlist in the service of his country. You have abandoned the press in the navy; you repudiate conscription; cast to the winds the inveiglements of the recruiting serjeant, which are unsuitable to this age.

Real economy will be consulted by employing the best men in the population, and limiting their numbers. As in the middle ages men covered themselves with armour till they could not fight, so there is a constant tendency now in nations to call out great armies, which they cannot move or maintain in health. It is a species of cowardice. Let us not imitate their example. Queen Victoria, like Alexander, can find soldiers wherever she can find men; and there are eight millions of them in these islands; but it is quite certain that if a large part of the population become as familiar with the rifle as their ancestors were with the bow, an army and navy of 800,000 men—the equivalent proportion of the force under arms in 1811—*will never be required in any future war.* Half the number of skilled men will do the work.

The descendants of the small armies of men that won victories under Edward III., Henry V., Cromwell, Marlborough, and Wellington, will always sustain the honour and interests of their country. Give her volunteers, create a militia by all means; but this country out of its present population can organize such a regular army as will never fail “to destroy and break to pieces whatever force is opposed to it.” The flag which Blake hoisted in the Mediterranean will still float over its waters; and if England cannot preserve the peace of the world, her sword will bring down the scale on which it is thrown by the Queen. The colonies will be defended; these shores will remain inviolate.

MALE POPULATION of SEVEN GREAT STATES, distinguishing the Numbers living at Five Ages.

(See Registrar General's Sixteenth Annual Report, Appendix, p. 123.)

Years for which the Population in the Table is given.	STATES.	MALES.					
		Total.	0—20.	Military Age, 20—40.	40—60.	60—80.	80 and upwards.
1851	England - - -	13,687,545	6,417,101	4,111,431	2,215,353	842,624	70,931
1851	France - - -	17,794,964	6,562,179	5,541,462	4,020,275	1,566,864	104,184
1844	Turkey - - -	17,533,121	9,361,323	4,784,490	2,443,275	857,013	82,023
1840	Austria - - -	18,202,631	8,465,132	5,242,611	3,271,212	1,152,356	71,320
1849	Prussia - - -	8,162,805	3,821,608	2,535,891	1,312,320	462,986	
1855	Russia - - -	33,448,093	17,853,678	9,127,414	4,670,594	1,634,931	156,476
1850	United States of America (exclusive of the coloured population)	10,026,402	5,114,831	3,160,023	1,339,833	376,427	35,278
	TOTAL - -	118,855,564	57,600,852	34,503,377	19,337,872	7,413,463	