ON ACCIDENTAL DEATHS IN THE NAVY AND ARMY.*

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IN dealing with the subject of deaths by accident or by negligence occurring in the navy and army, it is fortunate to have a reliable standard from civil life through an equally long period in the Registrar-General's Reports, Annual Summary, 1874, Table 9, giving the causes of deaths registered in London in each of the thirteen years 1862-1874.

The mean population is approximated by the half of the sum of the censuses of 1861 and 1871, yielding 3,030,000 souls, which is here adopted as the divisor of the total of deaths under the various headings, after their division by 13, the number of years of the entire period.

The data for the services are abstracted from the Sanitary Returns published annually by authority; and, in dealing with these, the same rule has been observed as with the Report of the Registrar-General, the period of thirteen years being 1860-1872. In the Navy Returns for 1870 there is an exceptional calamity that augments the ratios of death by drowning—the foundering of H.M.S. *Captain* with 418 picked officers and men; but, in comparing the risks to life in the sister services, I have preferred to present this apart from ordinary risks.

It is to be regretted that the sanitary returns are not drawn up with uniformity of, at least, the "total results", as that would render comparisons less difficult than they now are. The specialities of the services would be treated apart, as at present; and with respect to these, I consider each service would derive advantage by copying some of the forms used by the other.

The gross totals, and the annual means of deaths from all causes, accidental or by negligence, drawn from these various sources, together with the relative ratios, are :

	Average Population.	ACCIDENTAL DEATHS.				
		Total in 13 yrs.	Annual mean.	Annual ratio.	Including the Captain. 13 yrs. Mean.	Ratio.
Metropolitans, of all ages	3,030,000	27,868	2143	.707	—	—
Army, 17 to 45 yrs. .	176,100	2290	176	1.	—	—
Navy, " " ..	52,700	2098	161	3.05	2576	3.75

A cursory examination of this table elicits a very great inequality in the risks incurred in the navy above those of the army in generally peaceful periods, when the latter do not exceed those of the metropolis more than 30 per cent. This percentage would be reduced if data were at hand for the classification of the metropolitan deaths by violence according to ages, since we are only able to show the gross statistics, including all ages, from the overlaid infant to the octogenarian run over by a careless driver—extremes of age in which deaths by violence are at their minimum—which reduces the ratios of working age, when they are at their maximum, in the statistics thus presented in gross; so that it may be assumed that, by classification of age-periods, the same ages in civil life would offer as high a ratio as those of the army. It is seen also that the ratio of violent deaths in the navy exceeds that of the army in the proportion of 1 to 3 per 1,000 men; so that, whatever may be found to be the ratios of deaths from climatic causes and from ordinary diseases, it is clear that, apart from them, the special dangers arising from calling are higher in naval than in military life. Although the naval ratios on this head are high comparatively with those of life ashore in a great city and in barracks and camps, yet there are grounds for the belief that they are still lower than those of the mercantile navy, concerning which full and reliable statistics are still wanting.

The second stage in this inquiry will be the estimating of the various elements of danger which, combined, render the sea-service so much more destructive by accidents than the land-service; to obtain which satisfactorily, the relative conditions of health, sickness, and mortality of the two services must be ascertained. Then we must proceed to examine the ratios of deaths by accidents of every description; and, finally, we may discriminate the same under the headings: in battle, or in face of an enemy; by drowning, without proof of suicidal intention; from all other kinds of accidental violence: the first being the specialty of the fighting services, the second being appropriate to sea-

life, and the last being the ground on which the sister services might be expected to stand somewhat on an equality.

The yearly averages relative to diseases and injury are, in round numbers, as follows.

Averages of 13 Years.	Navy.	Deaths.	Army.	Deaths.
Mean strength	52,700	—	176,100	—
Admissions, total	70,050	—	201,390	—
Deaths, total	—	615*	—	2949
Admissions for sickness ..	54,500	—	184,900	—
Deaths by sickness	—	445	—	2698
Admission for injuries ..	15,550	—	16,470	—
Deaths by injuries	—	161	—	176

By examining the ratios per 1,000 of these several elements, a fair estimate may be formed of the comparative sanitary conditions and the causes of mortality existing in the fighting services of the country.

Group I.	Admissions, total, to mean strength	Navy.	Army.
Group I.	" sick, "	1329	1143
	" hurt, "	1034	1050
	" hurt, to admissions, sick	295	93
	"	285	89.7
Group II.	Deaths, total, to mean strength	11.6	16.6
	" diseases, "	8.4	15.3
	" injuries, "	3.05	1.
	" diseases, to admissions sick	8.16	14.7
	" injuries, to admissions sick	10.35	10.68
	" injuries, to deaths by disease	371.	65.02
	" diseases, to total deaths	721.	902.
	" injuries, to total deaths	262.	59.
	" in battle, to mean strength	.16	.137
	" by drowning, "	1.72	4.6
	" all other injuries, "	1.16	4.5

The first group of these ratios per 1,000 proves that more men are taken under treatment in the navy than in the army; that the admissions for diseases are nearly alike in both services, while the admissions for injuries are more than thrice as numerous in the navy than in the army. Equality of disease and inequality of "hurts" are the prominent characteristics; and it remains to be shown whether these indicate similar relations in the mortality under these general heads—i. e., whether the death-rates by diseases are equal where the admissions for treatment of disease are equal; and whether the increased ratio of admissions for hurts in the navy carries a correspondingly high death-rate.

The second group affords the reply to these questions, where it is shown, on the very threshold, that the average total mortality in the army is about 50 per cent. higher than that in the navy, consisting in a much higher death-rate by disease in the former than in the latter service, which much more than counterbalances the higher death-rate by accidents in the latter; the deaths by diseases alone being 15.3 per 1000 in the army, against 11.45 in the navy by diseases and accidents combined, or as 31 to 23. This is a very strongly marked inequality, that indicates the greater salubrity of the conditions prevailing in ships over those of garrisons and camps in every part of the world, which may be assigned to the diminished force of climatic causes afloat, and to the decreased liability to zymotic and epidemic diseases which seamen enjoy relatively to soldiers.

Collating the data concerning disease and its mortality, we find :

	Mean Strength.	Admitted.	Ratios per 1000.	DEATH RATIOS PER 1000.		
				Dead.	To Mean Strength.	To Admitted.
Navy.....	52,700	54,500	1034	445	8.4	8.16
Army.....	176,100	184,900	1050	2698	15.3	14.7

The reading of which is this, that in the navy there are 84 deaths to each 10,000 men, and 81 deaths in every 10,000 treated for diseases medical and surgical; and that in the army there are 153 and 147 deaths respectively in the same conditions. It follows that the navy is, so far as the Sanitary Reports instruct us, a far healthier service than the army; but these reports afford no data beyond the proximate mortality resulting from diseases contracted in the services, as they do not trace out the history of the *invalids* who are discharged on account of disability from diseases attributable to or contracted in the services, without which, through at least three years after their discharge, there cannot be any accurate estimate of the mortality by disease dependent on calling, as applied to seamen and soldiers.

Naval returns prove that in the period of thirteen years, with which this inquiry interests itself, the annual average of invalids amounted to

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* The difference between the "total deaths" and the sum of the "deaths by sickness" and "deaths by injuries" represents "deaths by suicide", etc., which are not classed with "accidents".

35 per 1,000, concerning whom there are no published data to show how many have returned to the service with restored health, how many have died after their discharge from the diseases with which they were invalided, nor how many have been permanently broken down in health so as to become pensioners. Such data are essentially necessary to any just conclusions as to the pathological results of the seaman's calling, relatively to other callings, which becomes the more evident in consideration of the fact that a large proportion of the total invalids are on account of such diseases as phthisis, diseases of the heart and aneurisms, Bright's disease, and climatic diseases of the liver, dysentery, and the sequelæ of fevers. So far as is known, similar conditions surround the question of results among invalids from the army.

Thus the statistics of mortality in the services are to be accepted as the exponent of the direct results of disease, attacking previously healthy individuals and terminating fatally between the time of attack and that of arrival in England of such as were invalided, of whom a certain proportion may have succumbed soon after their return home; and, this return being effected more quickly by seamen than by soldiers, it follows that more invalided soldiers than sailors die on foreign stations, thus increasing the death-rate by disease of the army disproportionately to that of the navy while away from England.

Passing on to the consideration of deaths from accidental causes, we find that, as the duty of soldiers exposes them to higher ratios of death by disease, so that of sailors involves greater risks of destruction by violence, which is the special danger of their calling; and it is found that deaths by accidents are very rare among troops taking passage in H.M. transports, falling in much larger proportion among the outward bound than among others—for it is the sailor's work that kills.

There is in all minds an intuitive conception of this fact, in reflection on the characteristics of the seaman's vocation; performing duties that demand rapidity of motion on an unstable standing-place, where he is constantly dealing with unusually heavy bodies, or aloft, where he must devote his attention and his prehensile power to his personal safety in a degree always diminishing with the increasingly less favourable conditions of weather that of themselves render his position less safe. The terrible nature of the accidents that befall him is well displayed in the quotation of some of the injuries, prognosed as fatal on first inspection, if he have escaped annihilation by the stroke; among them are enumerated:

Multiple injuries by crushing, etc.	59
Fractures of vertebræ and pelvis	74
Fractures of skull, often complicated with other injuries equally fatal	429
Injuries of brain, cord, and viscera	49

Presenting a total of 609 in 52,000 seamen, against 474 for the army distributed among a body of men counting 176,000 of average strength, whose analogous cases of fatal injuries are thus classed:

Multiple injuries	32
Fractures and luxations	269
Contusions	48
Injuries of brain, cord, and viscera	125

These facts alone show the accumulated dangers by accidents, to which seamen are so much more subject than soldiers, that they may be regarded as special risks of the naval service.

With this light thrown in advance on the question, the force of the tabulated ratios may be the more readily understood; viz., that deaths by accidental violence are as 3 in the navy to 1 in the army, which may seem to depend on the greater number of accidents that occur in the former than in the latter service, standing as 295 to 93 of admissions for hurts; so that, with thrice as many admissions, there are thrice as many deaths: although, from difference of relative position and other reasons too numerous to mention here, it is credible that the admissions for minor hurts are relatively far more numerous than in the army. On the same ground, it must be inferred that, were the injuries admitted in the navy for treatment reducible to a parallel severity with those admitted in the army, the ratio of mortality to each 1,000 admitted would not be so low as 10.35 in 295 among sailors, against 10.68 in 93 among soldiers. For, deduct the excess of slight injuries from the navy admissions, and a higher ratio of deaths to the reduced number admitted, will at once appear.

Collating the data concerning accidental deaths, we find:

	Mean Strength.	Admitted.	Ratios per 1000.	DEATH-RATIOS PER 1000.		
				Dead.	To Mean Strength.	To Admitted.
Navy.....	52,700	15,550	295	161	3.05	10.35
Army.....	176,100	16,470	93	176	1.00	10.68

The reading of this is, that in the navy there are by casualties 3 deaths, and in the army 1 death, to every 1,000 men; and that the proportion of deaths to each 1,000 of accidents admitted are nearly alike, being as 10.35 in the navy to 10.68 in the army. At first sight this approximation might seem fallacious, and the opinion would receive support from other data in Group II, that out of every 1,000 deaths there succumb by casualties 262 in the navy to 59 in the army; but it is a complexity that clears away on a correct appreciation of the internal modifications proper to the service in their immediate and prospective conditions.

In whatever light it may be viewed, it will be admitted that a contrast so strong must originate in differentiating causes, influencing the principles of action of such large bodies of men. Every allowance being made for the impulse to run to the surgeon at once on the receipt of any injury, which declines with the shock and is therefore more frequently obeyed where the surgeon is always at hand, as on shipboard, than in barracks or camps where he may not be equally accessible; and also for the desire on the part of the surgeon to obviate inflammatory aggravation of slight wounds, which was formerly a common consequence, there remains a large margin for further consideration. Perhaps there may have been with soldiers a diffidence to being admitted to hospital, which, until 1874, incurred stoppage of pay: this feeling has had no weight with naval seamen, always free from such stoppage. Experience also teaches the seaman that the final consideration he may claim for disabilities arising from injuries may in no small degree depend on the early date of the record of the same made by the medical officer, which may influence the amount, if it do not deprive him, of a Greenwich Hospital pension. Besides this, the more provident of them become, while in health, beneficiary members of lodges and clubs ashore, and not unfrequently in ships, for the relief of those who are discharged on account of injuries: this has been a guiding principle of their community since the days of Elizabeth, when they voluntarily submitted to a deduction from their pay to institute the "Chest of Chatham", to which alone they could look for aid under such circumstances. In these respects, notwithstanding a general reputation for improvidence, the seamen of our day have not degenerated from their predecessors, as is clearly shown in the present agitation among them to create a fund, to be placed under control of the Government, for the benefit of their widows and orphans or fatherless children. It is to these principles of action we may look, I think, for an explanation of the reasons why the sick-list of the navy presents so marked a feature in contrast with that of the army as its excess in the actual number of admissions for hurts, as well as the disproportion between the numbers admitted for treatment and the proportion of fatal cases recorded, which, under the opposite conditions, might become far closer, as it is in the army. There is no other inference, in face of the great preponderance shown in the relative numbers of the directly fatal injuries on the side of the navy; because from that there must be a gradually descending scale of severity, and not a sudden descent from those of the utmost gravity to those of minor importance, free from every danger of a fatal result. But, with every just allowance on these grounds, even to the extent of one-half the admissions for hurts, there remains so wide a difference as to leave the inference that, from this habitual prudence of seamen in seeking treatment for every injury, however trivial, and from the extreme caution of their medical officers, the death-rate by injury is diminished in the naval statistics, not only in favour of the sufferers, but beneficially to the service itself.

The next and final point I have proposed for examination is that of the ratios of disease under the headings of "Battle, Drowning, and other Violence". With regard to these, we discover that under the first the loss of life is truly insignificant under ordinary service, free from great wars with civilised nations, although not without such hostile events as wars in China, New Zealand, and Abyssinia, in all of which the army *prestige* has sometimes stood as if alone worthy of national consideration, the services of the navy being subordinated to it in general estimation. Even with this drawback, it is found, statistically, that the actual loss of life in face of an enemy stands at a higher point in the navy than in the army. On each of those occasions sailors have formed an integral portion of the force employed; for, if the enemy have been unable to contest with them on their own element, they have been ever ready to co-operate with the army on shore to gain the object of the campaign, to which the history of our Naval Brigades brings ample testimony. In addition to this, boats' crews are sometimes, when employed on barbarous coasts, brought into conflict with the natives, thus undergoing considerable losses in battle, without the formal declarations necessary to our ideas of "war", although not the less so in its realities.

With reference to the ratios of "drowned"—1.72 per 1,000 in the navy, against .426 in the army—it may be said that, considering the

intrinsic natures of the services, it may well be a source of marvel and admiration that there should be only four deaths in the navy against one in the army; but out of this the question arises, why the army ratio should stand so high as it does relatively to that where lives are passed on the sea. But, if the appalling calamity that fell on 478 persons on board the *Captain* were superadded, the naval ratio would be raised from 1.72 to 2.46 per 1,000. For the reasons already given, the *Captain* has been excluded from the ordinary ratios.

Lastly, the deaths by accident from "all other causes combined" are as 1.16 to .435 per 1,000, or nearly as 11 to 4. This ratio, together with that of drowning, are the criteria which establish beyond question the greater risks of deaths from accidental causes to which seamen are exposed beyond the men of the army; and the reasons for its comparative excess are to be found in the lists of primarily fatal injuries given prefatory to the estimation of the ratios in both services.

Notwithstanding this proved inequality of the navy on the ground of the greater mortality by accidental violence, it is an irrefutable fact, that the causes of disease to which the army is exposed beyond the navy render service in it more inimical to life, or more subject to death-causes, than service in the navy, in the proportion of 17 to 12. Having in view the main features of this disparity, it may be hoped that, by increasing our efforts to mitigate in the respective services the causes of increased mortality peculiar to each, very much may still be done to render the lives of seamen and soldiers more secure than they are at present. Enforced attention to sanitary measures in the army and navy has already produced very marked improvement in their health-conditions, and a decrease of the mortality in both services, as shown by comparison of the later annual statistics with the average ratios of the past, affording us the highest encouragement to rely on statistics, and to persevere in the direction they point out. Greater care than ever before is devoted to the ventilation of ships, and to the diet and regimen of their crews, which is quite equalled in the army by improvements in barracks and in the selection of healthy sites for camps, to which we owe the decrease of death-by-disease rates which marks our era, in which it is deeply felt by all authorities that where by careful treatment we may, as practitioners, save hundreds, the enforced laws of hygiene will protect thousands from destructive diseases; and we are not forbidden to hope that, with reference to the casualties which present so large a summary of deaths by violence, there is a margin within the inevitable in which the lives of men might, by equal precautions adapted to that end, be rendered safe. Seamanship, like railway travelling, will ever exact an indefinite amount of sacrifice of life; and so imbued is the public mind with a sense of that necessity, that nothing short of a great wreck or a railway disaster creates any emotion. It must, however, have fallen to the lot of most dwellers on the depths of the ocean to see life needlessly sacrificed, where there is no coroner's law to investigate the circumstances and to assign blame where due. Where obedience is the fundamental principle, guiding men implicitly by the orders of their officers, it behoves those who command to dwell on these facts, so that their rule of action shall bear always the impress of foresight to prevent accidents, so far as may be, in a service where unusual risks are inevitable, but at the same time mitigable, as is proved by their greater frequency in some ships than in others. In the streets of cities, the rarity of fatal accidents depends much on the vigilance of police; and likewise it is not beyond probability that their frequency might be reduced in the navy, if special tabulated returns, not less minute in details than the returns of punishments, were required from every ship in commission.

Hygiene is the science of saving life by obviating the causes of death. As applied to diseases, the public services afford ample proof of its efficacy, and there seems to be no reason why the prevention of accidents should not be deemed worthy of being included within its legitimate bounds; nor why the combatant officers of both services should not be instructed in this science in their schools and colleges; for it is one which, from the earliest records of the military art, was deemed essential to the perfection of a great commander.

Concerning it, we read an interesting discussion of its merits and necessity in the first book of the *Institution of Cyrus*, as held between that mighty king, when a prince, and his uncle, to this effect. Cyrus speaks thus: "With respect to health, having heard and observed that cities wanting in health get physicians, and that generals, for the sake of their men, take physicians with them, so, when I was placed in command, I at once had regard to this point; and I believe that I have in my army men who are very skillful in that art." To this Cyaxares replied, "But these men are only like the patchers of worn garments, for it is only when men are sick that physicians are had recourse to; but your care of the health of your troops should be of a nobler nature—to prevent your army from becoming sickly, is what you, as a commander, ought to attend to." Then follow sanitary maxims, the

root of all army hygiene, imparted by the veteran to the younger soldier.

Thus we recognise that, from the earliest epochs of military history, hygiene has been regarded by the most enlightened conquerors as a study demanding their personal attention.

We may trace further back, by the aid of sacred history, the same principle of action in the Book of Leviticus, which contains precepts that have stood the test of three thousand years, embodying the experience of forty years of camp life, and there the execution was placed under the aegis of religion by an inspired leader and lawgiver.

In the modern history of civilised states, this important duty has become relegated from the limits of strategy and religion to those of medicine, with great advantage to mankind.

Whilst we accept the change as one adapted to the law of the fitness of social affairs, and may glory in this, that the practitioners of medicine, who were once looked at as like to the menders of ragged uniforms, have become the proper administrators of that which has been regarded as a very noble and divine office and function, we can yet safely admit that our own efficiency in it is proportioned to the enlightenment in the same path of those under whom we are called to serve, and therefore we may hail with satisfaction any course of instruction to them which would aid and support us in our endeavours to lessen still further the mortality amongst seamen and soldiers.

A CASE OF TRIPLETS, COMPLICATED WITH DOUBLE UTERUS.

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ON the 25th December, 1873, I was asked to see a woman, who, on my arrival, informed me that she was pregnant for the fifth time. She was about eight and a half months advanced in her pregnancy, and anticipated her confinement to take place in about a fortnight; but, as she was different in shape and size from what she had ever been previous to her other confinements, she wished to consult me.

She had, as I have already mentioned, borne four children previously to her present pregnancy, all of whom are strong and healthy.

Upon examination, she had a somewhat strange appearance. The abdomen seemed much larger than usual, and also to fall too far forward; and, at the same time, the width was greater than in most cases, with a well marked depression from above downwards, and a little to the left side. Upon further examination, I found that this depression was a distinct division between two tumours; the one upon the left side being the larger of the two, and reaching further up in the abdomen, also overlapping the tumour to the left side. At the same time, I could insert my hand between the two, separating them down to the pubes. I could also move the one tumour distinctly without in any way moving the other. Upon applying the stethoscope, I could detect foetal heart-sounds in both tumours. At this stage, I was firmly convinced that I had to do with a case of double uterus, each division containing a foetus.

My patient was a very intelligent person of her class, anxious about her condition, and wished distinctly to know what was wrong with her, for that there was something unusual she was firmly convinced. The case seemed so uncommon, that I declined to say anything concerning it until I had consulted with some of my neighbouring medical friends. Unfortunately, I never had any opportunity of doing so, owing to her labour coming on rather suddenly two days after my visit, and before I had an opportunity of consulting with any of my brethren.

I was called again on the 27th December, at 7 P.M., found the os fully dilated, the head presenting in the first position; and in a very short period she was delivered of a healthy female infant, which weighed a little over six pounds. The pains continued, and a breech presented, and in time we had another female child, this time weighing rather less than six pounds; in ten minutes, with a little assistance, the double placenta came away, and the newly emptied cavity contracted well.

There was now the well contracted womb in the lower part of the abdomen, to the right side; but there still remained the other tumour, which lay to the left, and rather behind the lately emptied cavity. It gradually assumed a middle position in the abdomen, and inclined to fall forward and overlap the contracted womb; however, I applied a binder in the usual way, and, with the exception of an occasional after-pain, she felt very comfortable.

After waiting about four hours, and there being no appearance of any action in the remaining tumour, I left, after giving the nurse instructions as to her duty if there should be any symptoms of labour in my absence.