[Notes on various diseases]

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562/2

The Prevalence of Venereal Diseases in the British Army.—

The army at Home.—

The great prevalence of Venereal disease in the British Army (and the resultant loss of efficiency) has for many years been a matter of discussion, ~~in~~ military & medical circles, and, at this time, when the nation has been called upon to make great sacrifices in order to increase its powers of defence & offence at home & abroad; all matters which adversely affect the efficiency of our Army & Navy have become matters of vital importance & interest. It may be fairly claimed by the authorities that the care taken of the health of the soldier and the attention paid to the hygienic condition of his surroundings will compare favourably with that of the best organised troops of any other country in Europe. We are slightly however to compare that ~~with the~~ the fighting power of our forces is very considerably

impressed by the great prevalence of venereal disease amongst both officers & men of ~~of our Army~~ - and the prevalence is in many places increasing. We therefore feel justified in saying that one of the most practical ways of increasing the fighting strength of our forces would be to take steps to protect our troops from the ravages of venereal disease. In the following pages I propose to first consider the prevalence of venereal disease 1. in our Army at Home
2 in our Army in India
3. in our Army in the Colonies

and the factors which appear to influence that prevalence.
In the second part of the paper I propose to discuss the question of prevention of venereal diseases in our Army, ~~I would like to do this~~ and to make ~~many~~ suggestions as to the present measures ~~in~~ our experience & my studies could be taken most practical and practicable.
In order to do this, it will I think be admitted that a preliminary enquiry is necessary ~~it~~ in order to learn the lessons to be derived from a study of

the history and natural history of
these venereal diseases that we
may usefully draw lessons to the matter
we have in view, the prevention of these
diseases. [illegible]
set apart [illegible] for [illegible]
in the study these diseases & their effects
history, and of experience and also [illegible]
possible from the standpoint of biology.

Prevalence of Venereal in Home Army. —

We are very ignorant of the actual
amount of venereal disease in our army, at different times
to 1860 when the A.M.D. first began
to issue its annual reports on the
health of the Army. We know that returns
existed prior to 1860. They were first put
upon a proper basis by our first Director General
Sir W^m McGregor whose these returns
are inaccessible to us. In a few
of the medical books written by Army Medical
Officers at the end of the 18th & beginning
of the 19th Centuries we get a little information
on the subject but it is very
little. Thus in
the works of Munro, Jackson, Ferguson,
Lawrence & others we get a little information
regarding the

venereal disease in the Army has very little light is thrown on the prevalence of these diseases. It is probable also that the returns would not be of little value owing to the want of method and detail in the returns. Thus the form of hospital return used in 1902 returned disease recorded in this form.

Acute chron. Wounds & ulcers Venereal Primitive Continuous Total

Dead sick last return.
deceased
invalided
admitted
discharged

From Gibraltar
A

From a more extended return given by Gibraltar we find that at the Army Detail Hospitals 1 Jan 1901 to 30 April 1902, 257 cases of Lues Venerea of which 2 died and 151 cases of Gonorrhoea under treatment. The total number of new treated in these hospitals during the period being about 4,500. This is exceedingly low number. Often a small proportion. There are in the return however many particulars given under headache, ulcers, sore legs, pains, opthalmia &c. which probably included syphilitic cases. A record in all old books on any medical re

are greatly struck by the number of men invalided for illness. It is conceivable that many of these were syphilitics in origin. Lawrence in his work on "the Health of Soldiers" (Lond. 1820) gives a few figures which show the amount of venereal in the 34th Regt. at home & abroad in active service. From May 1805 to Aug. 1808 — 248 admissions for venereal, on active service in the Peninsula during 1811, 31 admissions for venereal, during the year following the return of the Regt. to England 221. If we take the strength of the battalion as 1000 men (which is probably an error) we get admissions of 76.32 per 1000 per annum at home for the period June to Aug 1808 and 221 per 1000 for the year after they returned from (Dublin), which on active service in the Peninsula the rates are only about 31 per 1000.

It is obvious that no comparison can be made between the ratios of venereal in the army at those days can be gathered from these & similar sources. We therefore restrict ourselves to the figures given by the A. M. D reports from 1860 to date.

Note

The writer is unfortunately in that he has not had access to all these reports for about a year volumes are missing at this station. He has however been able to get figures from both on the subjects + from a few for intermediate returns. ~~These figures he cannot trust~~ The most accurate figures are naturally those from the R.M.O. reports.

Charts showing the rise + fall in the admission rates per 1000 for all venereal diseases since 1860, for primary syphilis and for primary venereal sores, and for secondary Syphilis for the years 1890 to 1895 are given.

Regarding these charts + the figures on which they are based the following points should be noted.

From 1854 to 1868 venereal diseases were classed altogether as enthetic diseases.

From 1864 to 1878 non-syphilitic venereal diseases were included under ~~the~~ diseases of the ~~male~~ urinary about organs + hernia are roughly speaking 1 per cent (10 per 1000) greater than they should be. From 1879 to 1885 non-syphilitic diseases were classed under the heading Gonorrhoea & its sequelae. From 1886 to date venereal diseases are passed

P. Syphilis, S. Syph, Primary Venereal Sore (among the Women P. Syph & Soft Sore), Soft Chancre, Gonorrhoea. These remarks apply to all figures in the tables which are taken from the W.M.O. Reports.

If we now consider the charts we note that from 1860 to 1875 inclusive there was a steady fall in the prevalence of all Venereal Diseases taken together. From 1876 to 1885 (inclusive) there was a constant rise in prevalence of all venereal diseases but from 1886 to date there has been a steady fall until it has now reached the lowest point since 1865. The curve for Primary Syphilis

India.

Prevalence of Venereal Disease in India.

I have already pointed out that venereal diseases are declining year by year in prevalence in the Home Army and that the type of the disease is also to some extent less severe than was formerly the case. In India however ~~since~~ a reference to the chart X total Venereal disease shows a steady rise in ~~the Army~~ admission rate per 1,000 for all venereal diseases since 1873. In that year the admission rate was 166.7 per 1,000. By 1882 it had risen to 265.2, in 1886 to 385.5, In the two following years it fell to 361.$\frac{2}{3}$ and 370.6, then jumped to 481.5 and 503.5 in 1888 and 89. It again fell to 400.7 and 409.9 in 1890 and 1891 after which it steadily rose culminating in 1894, 1895, 1896 in the ratios 511.4, 522.3, and 511.6. During the following ~~but~~ two years it ~~has~~ again fell ~~to~~ until it reached the ratio 362.9 in 1898. During the 13 years previous to 1898 ~~it~~ the ratio was only once lower than this namely 361.2 in 1887.

Our ~~Army in India~~ army of British troops in India is the flower of the British Army. It is largely composed of full grown and matured soldiers, and its numbers ~~two~~ Army Corps. It ~~may~~ therefore readily be understood that the

Primary Syphilis (which all the primary venereal sores) has not greatly increased since 1884, as Secondary Syphilis has greatly increased since 1884 - a very marked increase occurring in the former in the years 1889 & 1890 and 1892 & 1896, whilst Secondary Syphilis has been markedly on the increase since 1888 and more particularly so in the period 1894 & 1897, the last year being the highest on record. In other words the great increase in Total venereal disease has been chiefly due to the great increase in the prevalence of the most serious form of venereal disease, namely Syphilis.

steady and appalling increase in the prevalence of these diseases, with the accompanying diminution in offering of the hope of their diminution, gave rise to misgiving alarm in the breasts of all who had the interests of the Army (& the need of the Nation) at heart and here arose the stimulus for inquiring into the causes of this alarming prevalence and the means to be taken for the prevention & diminution of this prevalence. I attach two charts which show the rise and fall, as shown by you in the admissions ratios per 1000 for total Venereal disease, Primary Syphilis & Venereal Sores, and for Secondary Syphilis. If these be compared it will at once be evident how closely the curve of primary syphilis rises and falls, rise by you with that for total venereal disease, whilst the curve for Secondary Syphilis rises and falls not in the same years as the primary curve but as one and a part, a year or so after. Thus the corresponding rise in Secondary Syphilis to the rise in primary sores in 1889 occurs in 1890, the corresponding rise in Secondary Syph to the great culminating rise in 1894 occurs in the following year culminating in the highest Secondary Syph ratio known namely that in 1897. I attach a third chart as you which gives a diagrammatic representation of the growth of incidence of the various venereal diseases amongst in 5 year periods 1874 to 1898. In this

The loss of efficiency in the Indian army due to this cause may be gathered from the following table which shows the number of men constantly in hospital from this cause during the years. 1888 to 1898.

Deaths	Average Strength of Army in India		No constantly Sick	Average no of Days in hospital of each case of venereal.	
4	65	1888	68,888	~~20.68~~ 25.68	77
6	66	1889	69,266	28.39	72
6	72	1890	67,823	29.07	63
3	112	1891	67,030	29.50	109
9	76	1892	68,137	29.01	9.
4	27	1893	70,091	29.82	37
5	111	1894	71,082	~~28.77~~ 31.49	103
15	130	1895	71,031	3,200	158
14	479	1896	70,484	3,162.43	32.10
23	662	1897	68,395	2,991	33.32
17	569	1898	67,741	2.201.81	33.31

This table also shows from the average no of days each venereal case is in hospital, the no. admitted, and the no. of deaths that the disease has become more virulent during the last 10 years.

diagram I have drawn to scale blocks which represent 1000 men one for each period of 5 years. On each block I have colored to scale blocks which represent the average admission rate per 1,000 strength for each period of 5 years, red for total venereal diseases (~~red~~), ~~blue~~ violet for forming syphilis (including primary sores), and ~~for~~ blue for secondary syphilis. The red block naturally includes the other and the part naturally colored red may be taken as representing the admission rates for gonorrhoea. The part left uncolored shows the number of men who were not attacked by venereal disease during each period.

It may be that the reader prefers the actual figures on which these charts & diagrams are based. I therefore give them arranged in columns ~~as~~ They are taken from the annual reports of the Sanitary Commissioner to the Govt of India & from the report of Lord Enclose's Committee.

When studying these figures it is necessary to bear in mind a few facts concerning them which may else be lost sight of. Prior to 1871 the venereal statistics for the different presidencies were not compiled on a uniform basis and therefore do not permit of an exact comparison. Prior to the Mutiny figures are not sufficiently detailed but since then they have been so. In Madras detailed figures are not available prior to 1860 nor in Bombay prior to 1865. It has therefore been considered best to take the Bengal figures as fairly representative of the whole of India prior to 1871 and since that date the correct figures for the whole of India are given.

The comparison of the different official returns prior to 1887 however shows discrepancies particularly in the figures for total venereal admissions & admissions under the head Primary Syph. &c. Syph. Secondary. Where figures are given, it will be seen that the venereal admissions exceed the primary & secondary. It is difficult to account for this except on the supposition that the latter figures do not include the cases of primary & secondary syphilis which have been treated in hospital and not returned as admissions for venereal diseases. Before 1887 the figures for primary syphilis, Secondary Syphilis & Gonorrhoea may therefore be taken as correct the difference in the returns which referred to other venereal diseases being largely due to the existence of diseases such as Stricture, inflammation of inguinal glands, &c, which were not the result of venereal contagion.

It is obvious that the discrepancy in the amounts must be a very small one but it does nevertheless make the figures prior to 1887 a little lighter than they should otherwise be. Since 1893

A study of these figures naturally gives rise to the question,- What factors were at work in India and amongst the British Troops there which influenced (or may have influenced) the prevalence of venereal disease amongst them?

The outbreak of the Mutiny in 1857-58 was followed by a great increase in prevalence of venereal disease. This increase was largely attributed (by the Sanitary Com^n to the first of India) to the large influx of new and unseasoned troops, a large percentage of any number making up the Indian at that time. By 1859 the troops in Bengal were newly trebled & in April 1858 16% of the troops are said to have been under 20 yrs of age. In 1864 only 2.42 % were under 20 yrs of age.

Lagneaux says that 42½ per cent of all cases of Syphilis occur amongst persons between the ages of 20 & 30. One would therefore naturally expect to find that the influx of large numbers of young soldiers to India would be followed by an increase in the amount of syphilis amongst the Indian Army. In our Army since the short service system was introduced the vast majority of our soldiers are between the ages of 20 & 30.

To page

The introduction of the Bounty led to considerable changes in the terms of service of the Indian Army. Prior to this the service of the Queen's troops in India was very long. Amongst the E. I. Co's troops it lasted practically for life and 30% of their troops were allowed to marry. These conditions were never restored and the introduction by Lord Lansdowne in 1890 of the Short Service System soon brought about a very great change in the constitution of the Indian Army as regards age and length of service. The results of this change in the Indian Army were.

1— An increase in the number of new troops arriving in India every year.

2. An increasing proportion of young men amongst the troops

3. A reduction in the number of married men in the army + the corresponding increase in the number of those unmarried.

The first two results did not make themselves really felt until 1876 and did not attain their full development until 1886. (see chart and tables). The third result followed almost immediately. The percentage of unmarried men which before the mutiny as low as 70% rose from 88.65% in 1872 to steadily 90.3 per cent in 1877 and 96.71% in 1894 it then fell a little and in 1895 was 95.4%.

"Acid Fast Bacteria." — Tubercle, Leprosy, Smegma Bacillus, Timothy Bacillus, Butter Bacillus.

Stain by Gram.

B. Subtilis, B. Butyricus,
Staphylococcus Pyogenes
Staphylococcus aureus
Pneumococcus
Anthrax.
B. Diphtheriæ Pecoris
Actinomycosis (Human)
Tubercle
Leprosy
B. Tetani
B. Enteritidis Sporogenes
B. Cavicidus Capsulatus (Klein)
B. Aerogenes Capsulatus (Klein)

Do not stain by Gram.

B. Coli.
B. Typhosus.
Pseudotuberculosis Rodentium
Pneumococcus
Diphtheroides Intracellularis (Westenhöffer)
Smegma Bacillus
B. Pyogenes Foetidus
B. Mallei
Spirillum Obermeieri
B. Pestis
B. Pyocyaneus
B. Malignant Œdema
B. Subtilis
B. Butyricus
B. Typhosus (Eberth)
B. Coli (Escherich)
B. Enteritidis
B. Cholera Asiaticæ
B. Proteus Vulgaris
B. Pyocyaneus
B. Malignant Œdema

Motile

B. Typhosus (Eberth)
B. Coli (Escherich)
B. Enteritidis
B. Cholera Asiaticæ
B. Proteus Vulgaris
B. Pyocyaneus
B. Malignant Œdema

Do not stain by Gram.

Streptococcus Pyogenes
M. Tetragenus
B. Pyocyaneus (Ghon)
B. Cholera Gallinarum
Coli Simile
B. Lactis Aerogenes
B. Enteritidis
B. Typhosus
B. Pestis

Pneumobacillus
Pneumococcus

B. Diphtheriæ
B. Pestis

Motile

B. Subtilis
B. Butyricus
B. Typhosus (Eberth)
B. Tetani
B. Proteus Vulgaris
B. Anthracis
B. Œdematis Maligni
B. Enteritidis Sporogenes (Klein)
a. chauvæi

Polar Staining — Plague, Typhoid (Eberth), Fowl Cholera.

With regard to the influence of the Short Semic System on the prevalence of venereal disease in India we can only say that the Short Semic System has in that country corresponded with but a strong increased prevalence of venereal disease. The rise in prevalence commenced in 1872 and the Short Semic System began to influence the data in India about the same time. It may be only a coincidence and not a result.

With regard to the effect of the increase in the no. of new arrivals in India during 1875 it is not so easy to make out the effect on the prevalence of venereal disease. It may however be noted that coincidently with the increase in the number of new arrivals in 1878 and 1885-1886 there were marked increases in the prevalence of venereal disease in the years 1878, 1885 & 1886. On the other hand a diminution in the number of new arrivals (which amounted in 1881 to nearly 5 % less than that of the year before and which standing fell between 1885 & 1889) was not coincident with a fall in the prevalence of venereal but with a continuation of the increase of the prevalence. It will be interesting to note what effect the increase of new arrivals in 1899-1900 has on the prevalence of the disease. If we consider the effect of the increased youthfulness of the troops in India on the prevalence of venereal disease in that country. Between 1872 & 1876 the percentage of troops under 24 yrs of age in India fell rapidly rapidly from 6 % from 1876 to 1886 the percentage gradually increased & fell 4 %

Mortis
Stain by Gram
Sporing Relation
Sporing Rods:
Non Motile
Stain by Gram
Negatively Relative
Spore bearing

B. Subtilis.

B. Anthracis.

B. Endoides (Sporogenes (Klein))?

Stain by Gram
Negatively Relative

Do not stain by Gram
& Do not negatively Relative

Motile
B. Subtilis

Non Motile
B. Anthracis
Staphylococcus.

Motile
B. Coli
B. Typhosus
B. Enteritis

Non Motile
A. Pyogenes
B. Lactis Aerogenes.

Spores in	Spores	Motile	Liquefy Gelatine	Stain by Gram.
B. anthracis	yes	very motile	yes	yes
Anthrax	yes	non-motile	yes	yes
Subtilis	yes	motile	yes	yes
Tetani	yes	non-motile	yes slowly	yes
B. Pyocyaneus	no	motile	yes with fluorescence	yes
B. Prodigiosus	no	immotile	yes with red centre	no
B. Typhosus	no	very motile	no	no
B. Coli	no	motile	no	no
B. Lactis Aerogenes	no	immotile	no. Acid and gas from sugars	no.
B. Tuberculosis	no (?)	non-motile	no growth	yes.
Pseudo Diphtheriae Vitulorum	no	very motile	Rapid liquefaction	no
Cholera Gallinarum	?	very motile	Slowly liquefies	no.
Malignant Oedema	yes.		yes	no.
B. pyocyaneus	no (pseudo spores)	no.	no	yes
B. enteritidis (Gärtner)	no	yes	no.	no
B. Suipestifer (Salmon & Smith)	yes	yes.	yes.	yes.

and in 1894 there were 21% more soldiers under 24 years of age than there were in 1876. With one minor reservation the increase in the prevalence of venereal disease in Italy has been continuous during the whole of that period. We may argue therefore that the increase in proportion of young men in the Italian Army has had an effect which has been coincident with a rise in the prevalence of venereal disease. Since 1886 the percentage of soldiers under 24 years of age in the Italian Army has not fluctuated much year by year, and it is clear from these facts that the venereal diseases have attained their greatest prevalence since that age.

The effect of the third result of the introduction of the 3 years system to Italy, namely, the increased percentage of unmarried soldiers in the Italian Army, on the prevalence of venereal disease in the Italian Army may be briefly stated. The percentage of married soldiers has fallen from 30% before the system to 11.32% in 1872 and slightly rose by 1876 to 3.29% in 1893 + 94. It has since risen to 4.5% and 5% during the years 95 to 98. In other words their increase was from 1872 to 1895 a steady decrease in the no. of married men in the Italian Army and since 1895 the increase has been practically a little exceeding to less than 2%. This steady decrease in the no. of married men has

since 1872

connected with an [illegible] increase in the number of admissions for [illegible] venereal diseases in the whole army. There is no doubt but that this fact does account for some part of the increase in venereal but obviously it cannot possibly account for the whole. Let us consider for a moment what proportion of the increase in venereal disease may be laid to the account of a diminution in the married strength of the married army. The returns do not now differentiate the amount of venereal disease amongst married soldiers from that amongst the unmarried & that we must go back in the records in order to find a comparison. Returns for the years 1867 – 1872 showed that the percentage of admissions for venereal amongst the unmarried soldiers was 50 times the percentage amongst the married soldiers & 1875 the percentage amongst married men was only 89 per 1000 and the venereal admissions rate was [illegible] per 1000. We may say therefore [illegible]

That is 1875 in every 1000 men

890 unmarried men aged 20–45 admissions per 1000

110 married men 402 admissions per 1000

In 1894 the married strength was

supply 93% and the total strength

admissions per 1000 men supply 511.

∴ 970 unmarried men aged

In 1875 the percentage unmarried men was

supply 89% in 1894 it was

supply 97%.

If we suppose the admission rate in true values

both years to have been the same

say 100 per 1000 amongst unmarried

soldiers $\frac{100}{50} = 2$ per 100 amongst

married soldiers. On a strength of 1000

In 1875, 890 unmarried men would have had 890 admissions

whilst 1100 married men 2·2

892·2

970

·6

970·6

In 1894 9700

300

That is to say a ~~difference~~ mirene of 8%
is the percentage of unmarried men
in the army, the general admission
rate ~~varies~~ for ~~each~~ land, the same
relative proportions to one another (as in 1867–72)
on the basis of 100 per 1000 admissions
per unmarried & 2 per 1000 admissions per
married ~~accounts~~ accounts for an ~~difference~~ likeness in
the total admission rate of 8.8.4 — a very serious mirene.

On the supposition
basis of 500 per 1000 & 10 per
1000 respectively ~~the same~~ a mirene
of 8% in the unmarried would account for
a mirene of 39.2 per 1000 in the general admission.

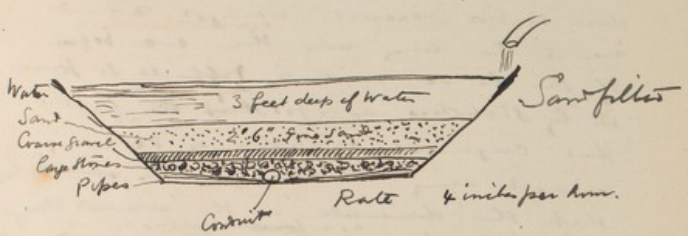
We may therefore I think ~~definitely~~ certainly
consider that the ^ diminution in the unmarried
strength of the Indian Army since 1872 has been a
^ factor which ~~has~~ exhibit accounts for
Contract
a part of the steady mirene in the general admission
during that period.

Another point worthy of note is that the
woman who marries a soldier ~~does~~ now adays
~~does~~ is as ~~similarly~~ of better class & higher
education than the married woman in the army
of ~~the~~ ~~former~~ a generation or so ago.

There is less venereal disease amongst them now than there was then and we may I think safely say that there is less venereal amongst civilians in the army now than ever before If this be so + it is difficult to prove it by statistics as especially the fact that congenital syphilis is decreasing amongst army children it is probable that the diminution in the armed strength has a greater effect as a cause than increased prevalence of venereal disease of course there can be no argument based on the relative prevalence amongst armed + unarmed and in the period 1867–73 would lead us to suspect.

So much then for the effect of the Short service system + its results on the Indian prevalence of venereal disease in the Indian army I have already pointed out the influence of this factor in point of time with the great rise in venereal admissions from 1872 to 1895.

There is one other factor at work in our Indian army which also coincides in point of time with this period. I refer to



the Army Temperance Association the
Good work of which commenced in 1873 and has since
steadily increased year by year in influence
amongst the soldiery. I
will deal with this subject more fully
later on it is sufficient to say at
this place that during the
period 1873 — 1895 the membership
of the A.T.A. has steadily increased from
1,015 to 23,472, at the present moment the
British Army in India is more
than any other body of English speaking
men in the world and yet the amount of
venereal disease has increased during the period
of the great increase in temperance in the
Army whilst alcoholic excess may be said fairly
roughly to have diminished in inverse ratio
during the same period. Personally I do not
think this is a matter of cause & effect nor does
it Temperance does not mean a result but indicate
prevalence of venereal disease. I think
the causes which produce the increase & decline
in venereal in the Army as a whole also produce
a corresponding increase in the prevalence of

[illegible] general dread amongst the members of the A.T.C. At the same time, I must say that I am afraid that there are some grounds for believing that [illegible] efforts in the cause of temperance have largely replaced efforts in the cause of religion amongst the men. Temperance is now becoming the soldiers religion. The belief amongst the soldiers that an A.T.A. man can do no wrong is largely in the universe. The fault of it is that [illegible] efforts in the cause of religion produce a corresponding [illegible] in the morals of the soldiers whereas efforts in the cause of temperance do so only in a minor degree. [illegible]

I come now to a fact which it is very difficult for any outsider even to form an opinion namely the effect a measure of Sunday legislation has had in the past on the prevalence of venereal disease in the Indian army. I have devoted many months to the study of this question and have read a considerable amount of the literature on the subject and [illegible] taking care to read [illegible] the works of those in favour of [illegible]

measures of sanitary police a "réglementation" and of those opposed to all legislation in this direction. In addition it has at different times been in close communication with friends who may be regarded as opposing parties on the question. The facts concerning legislative measures with a view towards the prevention of venereal disease in India are as follows.

The first outbreak of venereal disease in the army which occurred in India after the outbreak of the Mutiny was considered by a Royal Commission which sat from 1859 to 1863. This commission had brought before them information concerning certain preventive measures adopted at different times and places in India prior to the Mutiny. These measures were chiefly two in number at some stations Lock hospitals had been established and in regimental establishments & supposed prostitutes had been made. Thus in 1805 Lock hospitals were largely established in Madras & 1808 they were officially stated to have failed in diminishing disease, owing to the lack of an efficient police. In 1809 nine out of 17 hospitals were abolished

In 1810 it was stated that 1/7th of the troops at Bangalore were diseased. Govt therefore reestablished lock hospitals at all stations where there were British troops.
In 1828, a similar system appears to have been in operation in Bengal
In 1830 the Bengal lock hospitals were abolished largely as a result of protests by the Indian Brethren.
In 1835 Govt closed the lock Hospitals in Madras in spite of the protests of the Madras Medical Board.
In Bengal in 1835 reversal is said to have occurred in Madras it was said to be on the increase.
In 1842, hospitals were reopened in several stations but more as voluntary charitable dispensaries than as lock hospitals
In 1855–1860. Regular Lock Hospitals are said to have been reopened at several stations.
In 1861 Registration of prostitutes were made obligatory in Madras.
The Royal Comm presided
Its report to Parliament in 1863.
It recommended
1. Reservoir measures & police
2 Marriage & more restraint.
as the rule to urge & deal with the matter.

According to the Lock Hospital System as introduced in India.

In 1865 two Lock hospitals were established in India
In 1866 one ——
In 1867, 22 ——
In 1868, 5 ——
In 1869, 1 ——
In 1870, 1 ——
In 1871, 11 ——
In 1872 3 ——

During a total of 46 in operation before 1873. Four were added afterwards.
This system remained in full force until 1884
it was partially suspended from 1st June 1885
until June 1887 and was abolished in
the latter part of 1888. It is said to
have still existed de facto in some stations
until 1893.
In 1889, a new Contagious Act was passed
which authorised the Governor General in Council to
make rules to provide for the prevention of the
spread of infectious and contagious diseases
with a Contagious, & the appointment &
regulation of hospitals & other places with
or without a Contagious for the reception
& treatment of persons suffering from any disease

As a result Contonment hospitals were ~~found~~ established in the latter part of 1890.

In 1892 Govt of India issued instructions with a view to ensuring a strict observance of the Contonment rules & of the Resolt of the H. of C. of 5th June 1888. In 1894 several of the Contonment Hospitals were closed. In 1895 an act was passed by the Imp. Legy. in Council which prohibited any compulsory & periodic examination of women, by medical officers or others. The same act prohibited the registration & licensing of prostitutes in any Contonment. In the same year many more Contonment Hospitals were closed. Station Followers' hospitals were however established in many places which were intended ~~for~~ to provide medical treatment for Contonment followers & native inhabitants & were voluntary. At the end of 1895 only 13 of these Station Followers' Hospitals were in existence.

In 1896 a Departmental Committee with ~~the Chairman~~ the Earl of Lytton as Chairman was appointed to report on the Prevalence of Venereal Diseases among the British troops in India.

The report of the Committee on Journals
to Parliament on 20 Feb. 1597.
As a result of the report

Prevention of disease amongst Armies in the Field.

Synopsis.—

(A) Historical enquiry into diseases most prevalent amongst Armies in the Field with opinions of contemporary writers.

(B) Diseases {prevalent. medical & Surgical.

(B). Prevention of War diseases.

a. General efforts at prevention.

1. Preparations for the Campaign. { Clothing. Training for War. Age of Soldiers going on Service. Previous

2. During the campaign.

On Marching. On Sieges. The disposal of the dead (more a remark)

On Camps, Diseases of camp life. Sanitation

On Water Supplies, Water borne diseases & their prevention.

On Food. Sudden food influences the powers of the

b. Efforts of preventive Medicine to resist diseases. against specific diseases.

Such as malaria, dysentery, cholera, smallpox, plague, typhoid, relapsing, venereal, smothpox. ~~Enteric~~ typhus, Scurvy gangrene, pyaemia &c.

Aseptic surgery in the field & what to do when no antiseptics or dressings are left. Oakum, Straw, &c.

B 1.

Preparations for a Campaign.

There ought to be a medical branch of the Intelligence department whose duty should be to collect information regarding the physical geography, the sources of water supply, the endemic & epidemic diseases, the meteorology & climate, &c. of all countries in which there is any probability of the British Army being called upon to engage in the operations of war. The intelligence department should inform the medical branch of the probable lines of advance which would be taken for military reasons should an English army invade a country, and all information should be collected concerning the local peculiarities, endemic diseases &c of all places on these lines of advance. Such information should contain a list of all buildings suitable for hospital purposes, sites for camps, water supplies, local means of transport, railway systems, roads, local sources of medical supplies, &c &c.

On the outbreak of war all this information should at once be placed in the hands of the P. M.O. of † the force & might be with advantage printed in pamphlet or book form for the information of all the medical officers taking part in the campaign.

The Medical Intelligence Staff would also naturally study the medical history of former campaigns in different countries for from such histories a very great deal of valuable information for future guidance may be obtained.

† Note.- When Sir James Mc. Grigor received orders to proceed to the Peninsula to take over the duties of P. M.O. under Wellington he tells us "I went to the Secretary of the Board for instructions, to examine old & recent reports of sick & wounded from the Peninsular Army, in order to make myself master of the actual state of the health and hospitals concerns, & to be prepared for my duties."

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and have not been photographed.

A disease requires

1. A cause – a ~~micro-organism~~ microorganism animal or vegetable.
2. Predisposing causes, such as fatigue, cold, heat, poor feeding, overcrowding, &c.

The Microbe must enter the body either through the skin, mouth, or air passages.

After a lapse of time the incubation period the ~~disease~~ Symptoms of the disease begin.

The microbe enter the skin by small wounds or by biting flies or insect. ~~Bodily~~ Flies also act as carriers by contaminating food and water.

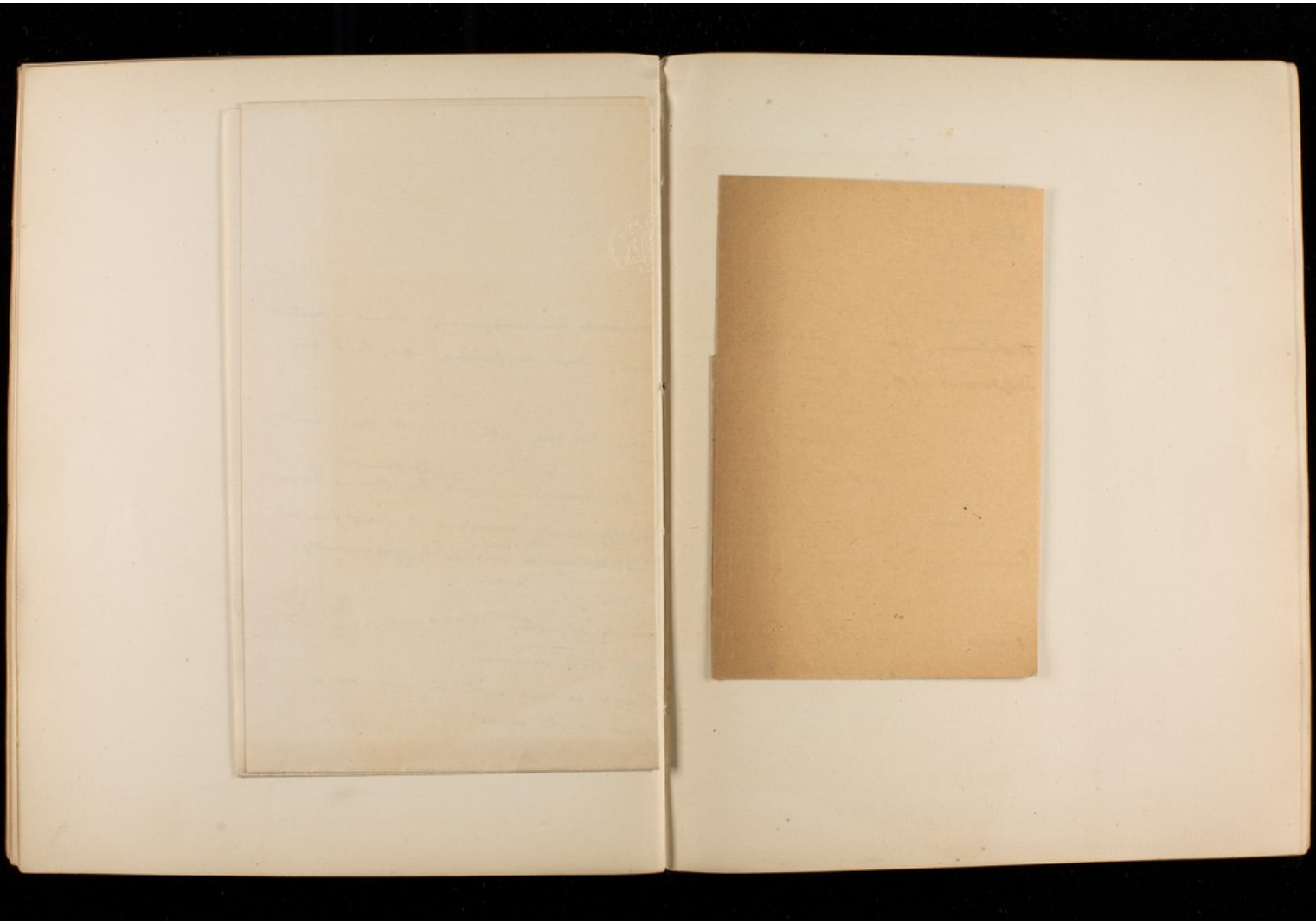
Diseases commonly affecting Soldiers.

It is simpler to classify these diseases into A. diseases likely to be met with in any part of any duration in any part of the world.

These are Typhoid
Dysentery
Diarrhoea
Typhus
Scurvy

B. Diseases largely due to the country in which the ~~disease~~ campaign is being carried on

These are Cholera, Malaria, Relapsing Fever, Plague,



R.B.C = 7·5 μ

Typhi. Bronchi.

Cholera 1 to 2 μ Turbid + film.

Relapsing 16 to 30 μ

Amoebic 30 to 40 μ

Trypanosoma Brucei 25-35 μ × 2 μ

Staphylococcus ·9 μ Turbidity + pptn. yellow.

Streptococcus 1 μ Granules + sandy deposit. Longer the chain the more opaque & larger the granules.

B. Pyocyaneus 1·5 to 3 μ × ·5 μ

M. Tetragenus 1 μ

Pneumococcus 1 μ Turbidity, dust like deposit

Pneumobacillus > 1 μ

Dysentery B. 1·5 μ × ·5 μ

Anthrax 5 to 20 μ × 1 to 1·25 μ in the blood.

Diphtheria 3 or 4 μ Granules present at ends + both of tube, broth clear with thin surface pellicle.

Tubercle 3 to 5 μ

Cholera bet. 50°-66°C (Stenberg)
Howlett 67°-68°C Soft cream coloured flocculus which slowly enlarges in size + number but broth remains clear + slight sometimes a dry film on surface. Quite free from a floating flocculus.

Typhoid 3μ X 6μ Tuberculosis
one film.

Toxic intra-cellular.

Dysentery 1 to 3μ X 5μ

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and have not been photographed.

Outbreaks of Measles during War.

The most notable recent occurrence of an outbreak of measles in epidemic form occurred during the Boer War in the Concentration Camps for Boer families in S. Africa.

The mortality in these camps during June, July, Aug. & Sept. 1901. amounted to

	Men	Women	Children.
in Natal	1 in 321,	1 in 190	1 in 60
In Cape Colony	nil.	1 in 313	1 in 992
In O.R. Colony	1 in 144	1 in 128	1 in 45
In Transvaal	1 in 213	1 in 156	1 in 31

The Camps in Natal, O.R.C. & Transvaal being practically in the seat of warlike operations ~~were~~ were probably more crowded & concentrated than in C. Colony. and the ~~the~~ the figures for these camps ~~are~~ give a mortality of

Men	Women	Children.
1 in 184.	1 in 145.	1 in 37.

This mortality is stated to be chiefly due measles. We know from the history of epidemics that measles if introduced amongst a people new before exposed to it is a very fatal disorder and perhaps this account for some ~~of~~ the excess of mortality in these Camps but

we have other instances of measles occurring in war which make us more inclined to believe that the virulence of measles is enormously increased by certain conditions, largely inherent to war, and there are overcrowding, defective sanitation, & the influence of defective insanitable and, possibly, scanty, food, and depressing mental conditions.

In American Civil War in 1866, Confederate troops measles caused 1,000 deaths out of 38,000 cases of sickness. In this case hostilities there was a mortality of 20 %.

In Franco German war, 1870, in Paris, 215 of the Garde Mobile contracted measles and 86, or 40 per cent, died. †

Remedies.— 1/ Isolation up of Camps & changes of sites, Isolation of cases & prevention of intercourse between infected & non-infected camps.

2/ Thorough sanitary control of Camps.

(From B.M.J. 9.11.01., Extr. Quotn Sir Walter Foster's address at Bristol.)

† After return of Funds from Natal. 40 out of 125 cases died in one hospital.
In Paraguayan Army at beginning of Brazilio-Paraguay War Measles swept away by the disease in 3 months. In his private practice he had no deaths & says mortality in army was due want of shelter & proper food.

1. Fatigue

PREDISPOSING Causes of Disease. Common & acute Forms. 104

The Influence of fatigue on the Secretion of Gastric Juice.

MM. Levi and Lilli (Modena) stated at the International Congress of Physiologists at Turin 1901, that they had carried out a series of experiments on dog with gastric fistulæ, fatigue being induced by racing on a track one being taken to avoid the possible influence of training. They studied the total quantity of juice and its acidity (HCl. & lactic acid) and the digestive power.

1. Exercise reduced secretion of juice in proportion of 5 to 6 as compared with rest. On enduring fatigue (tiring the dog out) the reduction in quantity of G. juice was double.

2. Acidity. — Both total acidity & that due to HCl was reduced, the reduction of HCl being most marked (HCl = ⅔ that of rest), organic acids not much decreased.

3. Digestion. — Time required for digestion was considerably increased. Food taking ½ 2½ to 3½ hours to digest at rest required 8 to 11 hours after exercise. Exercise in ratios 1, 2, 3, required digestive times in ratios of 1, to 1.25 to 1.70 respectively.

(B.M.J. 9.11.01)

Monti says Fatigue by exhausting the activities of the elements, and producing an auto-intoxication, also ~~according to the researches of the impostume~~ constitutes a condition predisposing to some infective diseases. Bouchard, Roger, and Charrin found that if rats & guinea pigs were exhausted by continuous exercise in a revolving cage numerous micro-organisms appeared in their blood. Their experiments demonstrate a diminished organic resistance to the invasion of microbes. Charrin & Roger also found that if fatigued animals were inoculated with attenuated anthrax cultures they succumbed in five days while animals not tired, survived inoculation with equal doses.

Note. – Romer retreat on Corunna. He overmarched his men & his losses day by day were influenced by the length & continuity of the days' marching, the greater the rest from on the troops the greater his losses. A continuous march of 36 hours lost him 10000 men.

b. Lessened nutrition.

The organic resistance of the tissues of the body to microbic infection is maintained and rendered possible by nutrition. Any diminution of nutrition leads to a diminished resistance to infection.
Italian observers have found that fasting rendered pigeons susceptible to anthrax against which these they are ordinarily immune.
Other observers produced analogous effects by depriving animals of water.

c. Cold. – Cold, in the same way certainly favours the action of certain pathogenic microbes. Thus Pasteur & others found that fowls (normally refractory to anthrax infection) became susceptible to ~~the~~ inoculation when their temperature was reduced to 37°C.
Monti studied the influence of chill on the production of pneumonia & found that dogs which are more resistant than men to pneumonic infection are taken ill & die when inoculated with the pneumo coccus immediately after a cold bath.
Heat. – On the other hand there is evidence that heat also predisposes to infection by certain pathogenic organisms. Thus Ferran & Salsano for example, ~~rendered~~ made guinea pigs susceptible to infection with fowl-tuberculosis, merely by exposing them to high temperatures.
If sunstroke be a microbic disease we can therefore understand the influence of heat as a predisposing factor.

+ quoted by Monti. "The fundamental data of Modern Pathology." Syd. Soc. 1900.

Other conditions are meteorological factors, altitude, climate, the seasons &c., traumata, poisons, &c.

"An infectious disease may be defined as the struggle for existence between the cells of the organism and the invading parasites." (Dreschfeld)

d. Traumata. — The traumata exercise a predisposing influence on infective disease in two ways, namely, either by producing solution of continuity & thus breaking down the barrier to the entrance of infective germs or by producing local changes in the organism without any solution of continuity thus producing a local diminution of resistance to the invasion by infective organisms. Thus it is found that if a bone be severed, contused, or broken, and staphylococci are injected into the blood osteomyelitis may be set up in the injured bone. If the lung be contused traumatic pneumonia may occur owing to the local diminution of resistance to the pneumococcus.

e. Poisons such as Alcohol, Chloral, Morphine, foetid gases, bad sewer bad drains putrid decayed food &c. act in similar ways in some cases through the nerves in others by a direct local effect on the gastro-intestinal tract.

f. Conditions which produce an anaemic condition of the blood and those which reduce its alkalinity render individuals more susceptible to diverse infections. (Several authorities quoted by Mosby)

2. Boots & its care.

Physiological.

Food

Clothing

Shelter

5.

Campaign.

Hygiene of. &c. G. Feed.

& Marching.

18. Care of the sick. Diseases which are best treated in tents.

THE INOCULATION OF BRITISH TROOPS AGAINST ENTERIC FEVER.

THE Army Medical Department in its Report for 1900 (Appendix X) states that returns are not yet forthcoming from the Indian Government of cases of enteric fever among the troops who were inoculated against that disease before they reached South Africa. Statistics from India show that 2,146 men were inoculated in 1900, of whom 21 were subsequently admitted for enteric fever, with 2 fatal results. This gives an admission ratio of 9.3 and a mortality ratio of 0.9 per 1,000. During the same year the total average strength of European troops gave admissions certainly fall in the year at the rate of 41.77 per 1,000, and deaths at the rate of 2.6 per 1,000. But the whole question as to the value of this method of prophylaxis cannot be satisfactorily discussed until the statistics are available concerning each man to whom the treatment is applied, the exact number of inoculations which he received, and the length of time before he is regarded as immune, the reaction of the person's blood to the Widal test when the treatment is ended, the average period during which this blood continues to give a positive reaction, and the actual risks of exposure to infection.

THE INOCULATION OF BRITISH TROOPS AGAINST ENTERIC FEVER.

THE Army Medical Department in its Report for 1900 (Appendix X) states that returns are not yet forthcoming concerning the incidence of enteric fever amongst the troops who were inoculated against that disease before they reached South Africa. Statistics from India show that 2,246 men were inoculated in 1900, of whom 21 were subsequently admitted for enteric fever, with 2 fatal results. This gives an admission ratio of 9·3 and a mortality ratio of 0·89 per 1,000. During the same year the total average strength of European troops gave admission and mortality ratios of 16·0 and 4·77 per 1,000 respectively. These figures certainly tell in favour of inoculation. But the whole question as to the value of this method of prophylaxis cannot be satisfactorily discussed until more statistics are available concerning such points as the number of inoculations which have been made on a subject before he is regarded as immune, the reaction of the person's blood to the Widal test when the treatment is ended, the average period during which his blood continues to give a positive reaction, and the actual risks of exposure to infection.

2. Boots & its care.
   Physiological.
   Feet
   Clothing
   Equation
   Sleep.

3 Preps for a Campaign.

4 Food. Physiology of, &c. 6. Fuel.

5. Water. 9 Marching.

10 Campo. 18. Care of the sick. Diseases which are best treated in tents.

PUBLIC HEALTH
AND
POOR-LAW MEDICAL SERVICES.

HEALTH OF ENGLISH TOWNS.

IN seventy-six of the largest English towns, including London, 9,18[illegible] births and 4,90[illegible] deaths were registered during the week ending Saturday last, August 2nd. The annual rate of mortality in these towns, which had

2. Births & its cause.
Physiological.
Food
Clothing
Lighting
Sleep.

3 Preps for a Campaign.

4 Food. Physiology of, &c. 6. Fuel.

5. Water. 9 Warming.

10 Compo. 18. Care of the sick. Diseases which are best treated in towns.

On Marching. – The success of a campaign or of an expedition in search of work very largely depends upon the marching powers possessed by each man and how this part in the campaign or expedition. Good marching depends on many things and a thorough study of the subject would entail the consideration of such factors as 1 the state of health of the man marching, 2 the weight he is carrying 3 how he is carrying that weight, 4 the nature of his clothing, 5 the state of his feet, 6 the length and frequency of his steps, 7 the nature of the ground, 8 the effects of climate & weather, 10 the frequency of halts, 10 the amount & nature of food and drink taken during the march, 12, the formation in which a body of men are marching – open or close order. These dozen factors on which good marching depends may however, be practically summed up and confined to two namely

1. The prevention of footsoreness
2. The prevention of fatigue.

1.

The strength of an army lies in its feet, and was it not Napoleon who said that the whole secret of success in war lies in being able to march 10 leagues, fight a battle, and march another 10 leagues afterwards? It matters not how powerful a hero skilful in war a man may be if he suffers from tenderness of his feet. The care of the feet is therefore one of the most important duties of a soldier.

If we were to put on one side the fact that a man may have deformed feet, and such deformity is by no means uncommon; we find that footsoreness is due almost entirely to badly fitting footgear – boots and socks or to want of cleanliness.

Boots & Socks. – Men should be carefully fitted with these. The army Ammunition boot although so often decried is really an excellent boot. It is strongly made of good leather, and, if properly cared for, is very comfortable. The foot is the soldiers friend the boot by trying to put a high polish on it. When

+ The commonest deformities met with are flat foot and overlapping toes.

Frank criticizing Egerton's speech highly of a boot which could be put on the leg and fastened up at the side by means of metal hooks & a series of holes.

finish varied it is to a left and shake but the repeated application of blacking, or of beeswax, make the upper become of an unyielding iron-like hardness. The result is chafing of the feet and ankles, blistering and general foot soreness. If in addition there is the pressure about the back of the heel of the old pattern clogging we have a condition which makes comfort in marching impossible. Blacking should be abolished in the army and the boot treated by rubbing well into it dubbing for the feet oil castor oil. Mutton fat is [illegible] largely used by [illegible] has also been strongly recommended to me by a Irish police officer whose men were notably good marchers.

If some better method of proofing the boot could be devised. Laced boots cause waste of time in fastening and the lace is liable to break. What is required is some more rapid method of fastening, say by one strap and buckle.

Ammunition boots are 3.2 sizes, right & left & weigh 4 lbs. the sole & heel are broad & the heel is low.

Boots may Or service in the field boots may, with advantage, be waterproofed. The late Professor Parkes strongly recommended the following recipe.

Take Shoemaker's Dubbin	½ lb.
Linseed oil	½ pint
Solution of India Rubber	½ pint.

Mix and dissolve by gentle heating, (the mixture is highly inflammable), and rub well into the boots. Boots may in this way be waterproofed for a long time and will remain impermeable for about six months.

The leg leave-up Elastic boot has its advocates. It may be worn either outside or beneath the trousers. It is easy to take off when wet and a very comfortable boot.

Socks Socks should be of wool, the Army sock is of worsted and a little number supplied the soldier is too small. Good clean socks are a great protection against foot. frost-bite. Dirty socks, soaked in perspiration, worn into holes and perhaps with fragments of sand inside all the night, the reverse of the comfort of dry & clean feet.

A liberal supply of seamless, woollen socks is therefore admissible in order that the feet soldiers should always have a clean pair to put on. Before going on service also the soldier should take lessons in how to darn a sock evenly and well. and should take with him a supply of darning needles & worsted for this purpose.

Should the supply of socks be limited and the socks be reasonable the soldier

A good way to wash cleanse a sock is to put it a few times in a solution of Condy's fluid. If the socks are full of holes and no means of mending available it is recommended to wear two pairs of socks, one pair over the other, as this equalizes the pressure on parts of the feet which have been made tender by the new sock. If the soldier finds himself provided with no socks at all he may adopt the German plan of evenly a well greased bandage round the foot or adopt the plan followed by the French Algerie troops who prefer a well greased foot to a well greased boot.

Gaiters: Gaiters or leggings give support to the legs & help them dry but the short legging in use at home is a useless incumbrance with nothing to recommend it. It presses on the instep & prevents the free movement of the foot.

If a legging is worn it should come to a hand's breadth below the knee and the lower end should be ~~like the Highlanders~~ Scotch-shaped so as to come well over the front of the foot & well down over the heel. Such a legging gives warmth, dryness, & support to the leg. It should also be of a pattern easy to put on & take off, like the Austrian, not requiring to be laced or buttoned but fixable quickly by means of one strap & buckle.

In Peninsular time every company had its cobbler who carried with him a supply of leather & the implements of his trade. The custom might with advantage be re-adopted in the Army. (vide Rifleman Harris)

Want of cleanliness is perhaps the commonest cause of sore feet. Nothing is better for the feet after (or more comforting) than to wash the feet with warm water after a long day's march and comma yellow soap. ~~Feet~~ The feet of

It has recently been found that
profuseness is in many cases
associated with the presence of various
micro-organisms (microbes) in the skin of the
feet, in the socks and in the boot. It is
easy to understand why this should be so.
The warm and moist foot of the boot
of the boot can imitate and the organic matter
in the perspiration and in the lining of the
boot provide suitable nutrition for the growth
of microbes. Under such conditions
the slightest abrasion of the foot leads to
sores which are extremely difficult to heal.
In such cases we would expect to find the
local application of antiseptics and thorough
cleanliness of foot, sock & boot lead to
the prevention and cure of sore feet.
And such has the fact has been found to
be the case. Various antiseptics have been
recommended. Washing the feet in
inside of the boot with solutions of corrosive
sublimate, Salicylic acid, or Carbolic acid

Diluted
have all been recommended. Condy's fluid also
makes an excellent preparation for this
purpose. Powdering the feet with
a fine powder of Boracic acid, or of
Boracic Acid and a little oxide of zinc
also has its advocates. The "Frosporder"
used in the German Army is said to consist
of Charcoal and Salicylic acids. This borders
the Rule
and dries the feet. Charcoal absorbs perspiration and
also acts as a germicide. In the Franco-German
war the Germans used an ointment composed
of Formin, one part, and zinc ointment
20 parts - and theoretically this should be an
excellent application to sore feet. One
lately recently tannogen, a compound of
formaldehyde and Formin has been strongly
recommended. Herbert and other German authorities
advocate washing the feet thoroughly with a solution
of formalin. once or twice a day. A
2 per cent solution is recommended. for the purpose.
The boot should also be washed out with the
same solution and then carefully dried. It is
said to check perspiration and it is certainly a strong
antiseptic and deodorizer.

Should however none of these substances be available ~~for~~ attention must be confined to cleanliness of the feet and their coverings. Spirits, in any form, may also be rubbed on the feet. This hardens the skin, but when this is done the boots should not be put on until the foot is quite dry. In cases of chafing a mixture of Soap + Soap, ~~or Soap only~~, may with advantage be rubbed on the outside of the sock over the part liable to be chafed. In former times many soldiers used to rub the whole of the outside of the sock with a mixture of Soap and Communication rum.

2. The prevention of fatigue. —

MS.

Campaign Diseases.

Relapsing Fever. — Outbreaks of this disease are always associated with overcrowding and ~~want~~ privations. The disease is frequently coincident with outbreaks of Typhus. That was the case during the Crimean War. It also occurred amongst the Russian troops in Bulgaria in 1878-79. Some 5000 male slaves are supposed to have brought the disease with them to India from Abyssinia at the close of the Abyssinian war.

Typhus. — Outbreaks occurred during war:- in Spain, in 1489, during campaign in Granada in Italy in 1528–1530, in Germany in 1540, in Hungary in 1566 (spread over much of Europe from Hungary), in 1572 in France, Netherlands & Germany. The widest diffusion of the disease in Europe was during the Thirty Years War. Germany the centre of the war suffered most but France & the neighbouring countries also suffered. It appeared in England during the Civil wars. It was common in Gustavus Adolphus' army. It again appeared in the war of the Spanish succession in France in 1673-1717) in Hungary & Austria during the war with the Turks 1683-97, in Poland during Polish War of Succession in 1734. Typhus was prevalent as a war fever 1757-1762 in Germany during the Seven Years War, & in Spain in 1764. A very severe period of Typhus was associated

with the French revolutionary wars at the end of the 18th Century, and lasted during the Napoleonic wars not ceasing until the overthrow of the Empire of Napoleon & the restoration of peace. During this period no part of Europe was spared the oppression of war, and "the particulars of war, and particularly typhus, following in the track of the conqueror and conquered, spread all over Europe and rose to a terrible height in those places where the visitation of war had been most severe" (Hirsch)

During the winter of 1854-55 the English troops in the Crimea suffered greatly, the hospital arrangements being inadequate & the Commissariat insufficient for our army. In the following winter there was a great improvement, our troops were in comfortable quarters. The French however this winter & the following one suffered terribly. Jackson says "There was no typhus in summer, while the soldiers lived in the fresh air, & left their barracks & tents open. With the cold season typhus developed two years in succession."

The returning troops at the end of the war brought the disease to England in 1856 and to the south of France.

It also spread from the Crimea to other parts of Russia. During the American Civil war there was no typhus amongst the Northern troops & only a few cases "in connection with overcrowded & ill policed camps" amongst the Confederates. During the Franco German war the German troops were quite free from typhus but the disease broke out amongst the French besieged in Metz being, according to Michaud & Vitry most frequent amongst the people crowded together in houses and the whilst there was little amongst the troops encamped in open spaces and outworks where the overcrowding was less. It ceased with the raising of the siege.

Finally there was a disastrous war epidemic of typhus during the Russo-Turkish war (1877/78) which decimated the Russian army in the Caucasus.

Overcrowding, Filth, & want of ventilation essential conditions for the development of typhus-free & the spread of the disease. (Hildebrand)

The maximum prevalence occurs in Winter & Spring. It is mostly a disease of cold & temperate zones & is independent of tellurie conditions. Worse in autumn,

Tropical climates are supposed to be exempt and is said to be unknown in ~~Cape Colony~~ central & Southern Africa. It is common in Persia & in Pekin.

Erysipelas. — Most common in colder seasons of year. Mostly a disease of the temperate zone. Epidemic in Military ambulance at Berlin in 1870-71. Also occurred in malignant epidemic from in N. America on many occasions

Hospital Gangrene. — The scourge of military hospitals in time of war in former times. It is a disease of all times and of every part of the globe but there is a preponderance of opinion amongst English & French naval & military surgeons that it is more likely to break out in the tropics than elsewhere. It occurred in the Peninsula, in the Crimea, in the Franco-German war, in the Austro-Italian wars, & in the Indian Mutiny American Civil War, Civil War.
It was held by the French & English surgeons in the Peninsula (Boyer, Boggie, Hennen) that the disease was most frequent during the prevalence of ~~hot~~ moist southerly winds.
In American Civil war, the U.S. surgeons thought that cold & damp weather favoured it.
Any hospital may become infected but it spreads most where there is lack of attention to hygiene and ~~where~~ particularly where there is lack of proper ventilation & overcrowding.

Scurvy. — Obstructs during War

Amongst Crusaders (Joinville)

1625. Siege of Breda
1631 Swedish army besieging Nürnberg.
1703 Siege of Ohrdruf
1760 In Canada
1762 Seven years war at Bremen } (Morris)
1824 Ryazan War. (Eng. Fr. & Turks) Siege of Schweidnitz.
1854-56 Crimean War & in Lancaster Gang a Domicile
1861 First troops at Alexandria (Lancey)
1857 Siege of Lucknow.
1862 Army of Potomac (American Civil War)
1870-71 Paris during the Siege.
1871 Amongst French prisoners of War at Ingolstadt

Munnich 20,000 French besieged 2,700 Spanish for 7 months. Only 600 capable [illegible] arms.

Thirlk says that out of 144 epidemics on land 55 occurred in connection with Sieges.
During Kaffir War in Cape Colony in 1836 only one regiment suffered severely although all more in want of vegetable food. Morgan says this regiment had undergone more privations & hardships than the other regts.

Scurvy is most of all associated with want of fresh vegetables in the diet. It breaks out the more promptly & severely, the greater the antecedent action of the debilitating things on the organism, predisposing it to sickness. Certain

errors of hygiene tend to endure the disorders of nutrition which underlie scurvy.

Armstrong + thinks that foul air has a direct effect in making scurvy worse and says "attention to ventilation in this disease, as in every other, should always be an object of our greatest care."

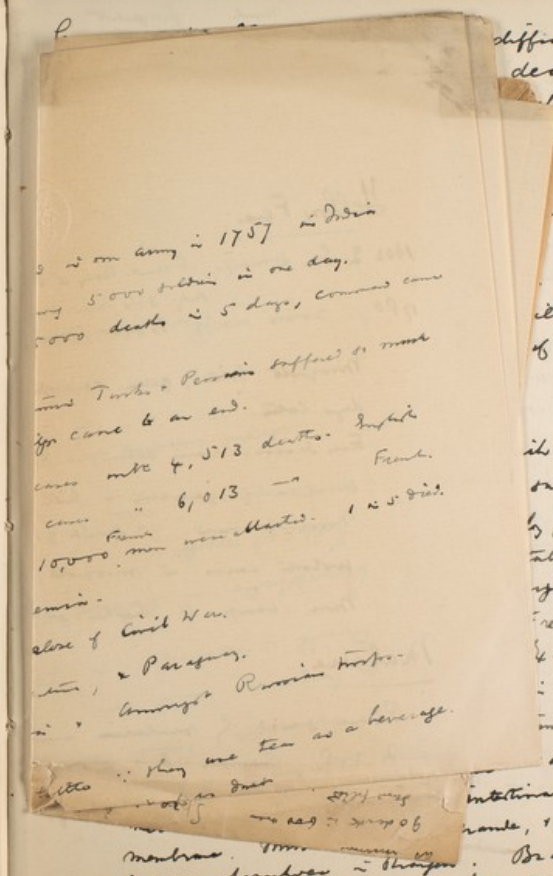
(+ Naval Surgeon. On Naval Hygiene & Scurvy, 4th, Lond. 1858)

Dysentery and Diarrhoea. —

There has been hardly a single war of long duration, hardly a single siege protracted over several months, in which dysentery and diarrhoea have not broken out in the hostile armies of the field, amongst besiegers and besieged. Among War pestilences, alongside of typhus and typhoid, these diseases have always taken a foremost place." (Hirsch).

Campaigns in which dysentery & diarrhoea have been severe. —

At Athens in Peloponnesian War.
Wars of Napoleon 1790-1815,
Crimean War 1854-55,
Franco German War 1870-71,
Russo Turkish War 1878-79,
New Zealand War 1860-61.
French Expedition to Mexico,
Civil War in America.



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Cholera

Cholera first appeared in an army in 1757 in India
500 deaths among 5000 soldiers in one day.
1817, Under Hastings 5000 deaths in 5 days, Commons came
to an end.
1821, In Mesopotamia Turks + Persians suffered so much
that the campaign came to an end.
In Armenia. 7,535 cases with 4,513 deaths. Russia
12,258 cases " 6,013 " French.
In Astrakhan. 10,000 from men were attacked. 1 in 5 died.

1866 In Bohemia.
In America at close of Civil War.
In Brazil, Argentina, + Paraguay.
Burton in India + Converged Russian troops.

Chinese suffer little : they use tea as a beverage.

as minimum
90 deaths in 600 cases
in Sandfield.

Spread by water, flies, fingers to mouth
Precautions. — boil all water
Soda in water
isolate the sick within the cell.
wardens
send all dysentery cases to hospitals
Accidentals drinks
Stop all uncooked vegetables and fruit
except oranges + lemons.
Avoid fatigue
Leave infected locality.
Hoffman's mixture. retains moisture by $\frac{1}{5}$ %

Yellow Fever.

1802 2 San Domingo French Army 58 545 men lost 50,270 men in 8 months.
Only 3000 men ever returned to France.
1750, 2000 out of 5,000 Spanish troops died in 2 months.

Mosquito bites, germ develops in mosquito, disease transmitted 12 days later.
Few cases. - rainy season. - June 4 Dec
Dimples & gauntlet & hill mosquito.
Mosquito nets. don't go out at night.
Isolated cases in mosquito netting.
Move camps to higher ground and dryer ground.

Malaria.

Rome saved by malaria amongst troops of Brennus
In 208, Romans lost 5,000 out of 8,000 in Scotland.
Walcheren. - 39,219 men. 23,175 attacked.
11,503 ordered after return to England
at Schouten. French lost 20,000 cases.
In American Civil war 1,314,744 cases.
French in Madagascar 22,000, 7,498 deaths.
Anopheles in natural collections of water. after rain
Bites at night
In Madagascar - men who sleep on board ship remain unaffected.

Avoid camping near native villages.
on sandy ground.
clear undergrowth

Paraffin oil.

Dysentery ... Campaigns. —

There has b...
a single siege ...
dysentery ...
hostile a...
and beca...
of typhus ...
takes a f...
Campaigns ...
severe. —
At Athens ...
Wars of Ra...
Crimean ...
France Jer...
Russo Tur...
New Zeal...
French Hi...
Civil War ...

Cholera

Cholera first appeare...
500 deaths an...
1817, under Hastings ...
6 on end.
1821. In Moorshedab...
that the compan...
In Armin. 7,535
12,258
2 Dorchesters.
1866
2 Armenia at ...
2 Bengal, Arg...
Burials in Jodh...

Chronic dysp...

Causes. — Use as food of articles difficult of digestion ... of decomposed ... wet clothes, sleeping ... water, & fatigues ...

...ists more than towns. Why? ...another.

...ship atmosphere may be true ... not easily digested foods. ...articles of diet such as ...

...ther soils in which ...soluble salts, sulphates ...mixed by putrid matter. ...vegetable matter in ... and dysentery. Such ...mount of Free Ammonia and ...& Nitrates. & ample Bombay ... Algae in water. ...water containing available ...use to drainage by ...intestinal mucous ... Mississippi, Rio Grande, & Ganges water ... Brackish water ... by Annesley & Twining to have some effect.

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Causes. – Use of articles difficult of digestion or altogether indigestible or of decomposed substances. Bad weather, wet clothes, sleeping on damp ground, bad drinking water, & fatigues incident to war.

Dysentery affects country districts more than towns. Why?

Country people more exposed to weather.

Constipation predisposes. Constipation may be due to ingestion of indigestible or not easily digested foods, immoderate eating of certain articles of diet such as fruits rich in vegetable acids.

Abuse of spirituous liquors.

Drinking water that is either rich in mineable mineral constituents or in soluble salts, sulphates particularly, or is contaminated by putrid matter.

Water containing decomposing vegetable matter is very likely to induce diarrhoea and dysentery. Such waters on analysis show small amount of Free Ammonia and great increase in Albuminoid Nitg. Example Bombay Tulsi water before rains. Algae in water.

Muddy drinking water, or water containing insoluble mineral constituents give rise to disorders by mechanical irritation of the intestinal mucous membrane. Mississippi, Rio Grande, & Ganges water produce disorders in Strangers. Brackish water is said by Annesley & Twining to have some effect.

In Algeria the French found dysentery much more frequent in the province of Algiers than in the provinces of Oran. The Algiers water was found to be rich in salts, containing large quantities of sulphate of soda & Magnesia & Carbonate of soda. Algiers water contained also Carbonate of lime. Belgrave in India, & Corbin China report that the water of rapid rivers is much less dangerous than that of slow & sluggish streams. Stagnant waters which are liable to be contaminated with decomposing animal & vegetable matters is always dangerous. Faecal contamination has been proved again & again to be productive of diarrhoea. Thus Bakes (quoted by Parkes) traced severe diarrhoea at Cape Coast Castle to the drinking of water from a tank replenished with drainage of faecal matter. Gore reported the same at Bulama. The troops in Dominica suffered from dysentery until the washing of dirty linen in the streams which provided their drinking water was stopped. An epidemic at Metz in 1870, and another in 1881, were traced to faecal contamination of wells. When the wells were closed the epidemic ceased. Soakage from stables has been known to produce the same effect. Floods may carry sewage into wells as at Prague in 1865 & the water thus came dysentery.

Virchow says, "Impure drinking water, tainted with organic matters in process of decomposition, is justly under suspicion of being able to call forth both typhoid fever & dysentery."

When dysentery is endemic or epidemic it is usually. It is the new arrivals that are mostly subject to the malady. Inhabitants of a place where the drinking water is impure become to some extent immune.

Chill is a strong factor in the production of dysentery. Times of great and sudden thermometric variations are always dangerous. In the Afghan Campaign of 1841 dysentery & diarrhoea always appeared whenever the diurnal ranges of temperature became noticeable (Hunter & Hartshill)

English & French army surgeons have noted the fact. Brunet in connection with Campaigns in Egypt. A traveller notes that those who used it had only slight diarrhoea at Alexandria noted Fevers are common & extremely dangerous. There is a special risk in the sudden falls of temperature accompanying the rain storms that come in the right time, often without any warning, and bring down the temperature as much as 10°R. (22°F.), or, in the hot season when the N.W. wind is blowing, even as much as 20°R (44°F.) It gives head then with those who does not awake soon enough to draw his blanket over him." In districts near mountains such falls in temperature are likely to occur.

Dr. Mullin noted at Barbadoes that dysentery was common in such districts & particularly so when "sudden vicissitudes of temperature are experienced".
The influence of moisture or dryness of the air is not so pronounced although there are writers who support both as predisposing factors. Dysentery has frequently occurred in epidemic form in times of heavy rainfalls and in times of drought. Musik says, of 126 epidemics, 65 arose with the wet weather or after it and 61 in the midst of continuous dry weather. He also notes that 10 out of 11 epidemics start between June & September (in temperate zone) & in every 50 epidemics, 37.5 occur in summer, 10 in Autumn, 1 in Winter & 1.5 in Spring.
Geographical distribution of dysentery drastically corresponds with that of malarial diseases.

Plague. — When this disease breaks out amongst troops in time of war it is usually coincident with an epidemic amongst the inhabitants of the country which forms the seat of operations. Examples:— Great Civil War in England, French in Egypt (described by Dr. Seigo), by Livy), Indian troops in Egypt in 1801 (described by Dr. Seigo), Outbreak amongst Russian troops in Danube districts in 1828-29 (Seidel) It has formerly attacked the same troops in Wallachia in 1770, and in 1738-39. In these instances plague spread to the surrounding countries. Black death which carried off ¼ of the population of Europe during the 14th Century appears to have been but a pneumonic form of plague.

Cholera in War time. — May break out in connection with local epidemics.

Examples - War.

1. Occurred in 1866 during Austro-German War in Bohemia. It had been prevalent in Prussia before the war & the disease was brought in Bohemia by Prussian troops.
2. Crimean War. 3. Afghan War of 1879 - The disease moved through the Khyber.

Lewis & Cunningham found highest rate of prevalence corresponded to highest level of subsoil water in Calcutta.

A hot-weather disease in most places. In Calcutta & Bombay after the rains (Sept. Oct).

Cholera dies out amongst troops if they are moved to a higher locality. Many examples of this in Military annals of epidemics amongst troops in the North of India, and Algeria, the Delta of the Nile,

Koch found that whereas cholera bacilli in small quantity readily die in the gastric juice if the HCl be neutralised in the stomach the cholera germs pass unaltered, rapidly develop in the intestine & cause death.

Such a diminution in gastric acidity may be due to a gastric catarrh or from even a slight dietetic disturbance this accounts for the susceptibility to attack of persons suffering in this way.

Epidemic Jaundice. —

Jaundice was epidemic amongst the Federal troops during the American Civil War.

Out of 2,217,959 men there were 42469 cases and 161 deaths. It is reported to have been very common during the present Boer War, to be very intractable to treatment and in many cases only yielded to after working from the Seat of War.

The earliest mention of the occurrence occurs in a work by Cleghorn - a British Army Surgeon - who met with it in Epidemic form in Minorca in 1745. (Observ. diseases of Minorca 4th Ed., Lond. 1779)

Since then it has broken out amongst troops both in time of peace & of War. During and after the siege of Paris of 1870-71, it was extensively amongst the French & Prussian, & several Epidemics have been described in French & German Garrisons. One epidemic occurred in a regt. in India in 1849 (described by Corrie, Bo. Transactions of Bo. Med. Surg vol. X.) who were encamped in close order on a site contaminated with dead animals & other putrefying matters.

Altogether some 300 epidemic have been described and half of these have occurred amongst soldiers.

The cause of the disease appears to be a gastro-duodenal catarrh, blocking up the common bile duct. It is natural to infer therefore that the chief etiological factor in the disease is some error in diet, the fact was shown to be the case at Frankfort in 1883 when the monthly pease has been issued to the troops, amongst the Prussians in Paris in 1871

where it was carried to monotony of diet (salt meat & rice) with an absence of fresh vegetables, amongst the garrison of Wesel in 1872 to the same (salt pork & peas). In these cases change of dietary led to recovery. Epidemics amongst French troops were in two cases traced to bad drinking waters. Other epidemics appear to have been due to faulty hygiene. At Arras in the emanations from a cesspit, at New Brunswick in 1875 to a moat filled with stagnant filth, at Barnet to a choked drain pipe. An outbreak at Bremen was traced to vaccination with humanised glycerinated vaccine. and Hirsch recognises the probability of many of the epidemics being due to a specific infection.

It will thus be seen that many influences at work which predispose to the disease, namely impure and monotonous food, impure drinking water, and exposure to cold & wet, as in India 1848-49. Should cases of jaundice begin to appear amongst troops in the field it is therefore probable that some one or other of these causes are at work or possibly a combination of them and it obviously becomes the duty of the medical officer on service to ~~become~~ investigate carefully the dietary & the clothing of the soldier, the water supply, & the conservancy of the Camp. If the disease becomes general it might be advisable to change the camp site, and arrange to change as completely as possible the dietary of the soldier paying particular attention to the provision of fresh vegetables and meat.

Epidemic Cerebro Spinal Meningitis. —

Examples:- Amongst Confederate troops in Virginia America 1862-63
Army of the Potomac 1861-62
At Gibraltar after battle amongst Seaforths
Manoeuvres other examples in peace time. It does not attack a whole army but selects regts. Therefore probably to do with sanitary conditions such as over crowding in unhygienic dwellings. Young soldiers (between ages of 18 & 24) most susceptible. Fatigue considered by some to be a factor. Epidemics 1837-40 due to movements of troops
Some writers blame action of soil, but others state the opposite. Soil therefore irrelevant.
Usually a disease of winter & spring

Tetanus.—

From Med.l & Surg.l History of the War of the Rebellion.

Of 246,712 injuries by weapons of war, 505 (0.20 per cent, or a little over 2 per 1000) were followed by tetanus.

Seat of Injury	Cases	Recovered	Deaths	Ratio of Mortality %
Head, face, neck	21	1	20	95.2
Trunk.	55	5	50	90.9
Upper Extremity	135	18	119	86.8
Lower do.	292	30	252	89.7
Total	505	54	451	89.3

Tetanus followed operations in 131 cases.

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and have not been photographed.

Malaria.

Capt. Ramsay Browning R.A.M.C. informs me at Peking in Chinese War of 1900 Artillery had magazine containing British troops more valley of canon Harbin & Bryhuk 1 to 40. Canteens afterwards bought for British, no more malaria.

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and have not been photographed.

Diplococcal Diseases.

Pneumonia, Cerebro Spinal Meningitis, Gonorrhoea

Common characteristics. - Diffinet to grow on artificial media.
all have capsules,

	Pneumococcus. (Fraenkel)	Diplococcus Intracellularis (Weichselbaum)	Gonococcus (Neisser)
Morphology	 lanceolate. Capsule well marked.		Capsule bad or differentiate
	Grow best anaerobically + in liquid media at 37°C (rabbits serum). Albumin media.	Grows readily on blood serum or ascetic fluid.	Grow best on media containing human serum, albumen. 24 hrs. at 37°C. Punctiform growth.
	Rabbits very susceptible to agar from capsules.	Rabbits immune.	
Staining.	Ordinary basic aniline dyes.		Ordinary basic aniline dies.
	Stains by Gram.	Does not stain by Gram.	Does not stain by Gram.
Where found.	In rusty sputa, in normal sputa, + in urine.	In pus (green, flocculent) base of brain, cerebellum & post. part of spine. Found inside cells of pus. In cases of pneumonia.	In polymuclears and free in pus.

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and have not been photographed

Typhoid. —— Hirsch says "There are few points in the etiology of typhoid on which there is ~~so much~~ more agreement in the opinions of observers, as on the influence exerted by one offence against hygiene, the ~~fault~~ frailty or inadequate removal of human excrement; — "the accumulation of faecal matter in cesspits, drains, & the like, or with the percolation of these matters into a porous soil to which air and moisture have access." The importance of this factor was proved by Buchanan & others who showed the great fall in the mortality rates of towns resulting from improved systems of sewage removal.

Typhoid in Federal Army during Civil War in America in 1862-63.

Out of 460,000 men in Atlantic region (Between Alleghanies & Sea) 29,666 cases of T. of which 7,092 died.

In Central region (Mississippi Valley) out of 403,000 men there were 23,530 cases of T. & 8970 deaths

In Pacific region (Oregon & California) out of 15,408 men (who saw however little in action) there were 155 cases & 13 deaths.

Rate of sickness therefore was, in Atlantic region 64·2 °/₀₀
in Central region 58·2 °/₀₀

and mortality rates per 1,000 in Atlantic region 15·4 °/₀₀
in Central region 22·3 °/₀₀.

There were in addition in the Atlantic region 12,093 cases of typho-malarial fever with 489 deaths.

(Med. & Surg. History of the Rebellion, (Prelim. Report) Philadelphia 1865)

Typhoid in Federal A
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Rate of sickness therefore

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(med

Typhoid.

Hüppe found that typhoid bacilli in recent stools were anaerobic and more susceptible to external influences than those in stools which had been kept for some time as in which the bacilli had become aerobic.

Rubner & Chamberlaine say 4 parts of slaked lime in 1000 water destroy Typhoid bacilli in stools in less than half an hour.

Bacillus typhosus.

In sterilised stools or stools which have been for some time kept for months
In stools soaked in Typhus cultures live for one year
In potato cultures live for 2 years.
In sterilised garden soil 21 days, street sweepings, 30 days.
In sterilised brine 60–70 days. In butter – one week
Free access of air shortens life
20 minutes at 60°C. kills (Pfuhl)
Freezing has little effect.
Sunlight is inimical.

Brookfield: allbut cure when typhoid is about boil water & milk, and peel all fruit.

Skin diseases on Active Service.

Chiefly those engendered by filth. Campaigns in countries where there is scarcity of water ∴ little water available for ablution.

Itch. — "In Napoleonic Wars the sufferers from the itch in the French armies were counted by the hundred Thousand." Hirsch. During & after the war between Germany & Austria in 1866, there was an enormous increase in the number of cases of itch treated in Prague. In 1866, 1129 cases, in 1867, 2256.
In New Zealand War — Troops emptying native huts became infected.

Pediculosis. —

Form of Ring worm. — devil itch; favus &c.

Tinea versicolor. —

Boils — usually climatic due to new arrival in a fresh climate.

Syphilitic eruptions. — Outbreak of predisposed to by hydrothiss inherent to service

Phagedenic ulcers of tropics: — Not connected with Hospitals Gangrene because at the time of their occurrence operation cases may be doing well.

Acne mostly on lower limbs in connection with Phylloxis vigines. The geographical distribution includes most Tropical & sub tropical countries in both hemispheres. In our Abyssinian Campaign they are said to have been very common amongst the native troops & followers. In Cochin China there were 700 fortnightly amongst 5,600 French troops and 160 died. They appear to be very common in the Arabian coast & there go by the name of "Aden ulcers" or "Yemen ulcers". According to Hirsch their occurrence is always associated with "poor diet, ill lodging, severe antecedent diseases or cachexia still remaining (malaria & remmy particularly), especially tropical anaemia, or to ~~a~~ chronic bowel ~~fa~~ troubles, & the like, the tropical climate seeming to influence all the while." They are said to occur in the interior parts of South Africa & the gastric organs, is there any connection between those and the so-called "Veldt Sores." They are said to be most common in low & damp localities & are particularly severe during the hot & rainy seasons.

Campo Soles. (at 15 - 20 ft.)

"A permanent low level of ground water is the best for health." (Hirschfeld in C. Allbutt's System)

Variations in level of ground water, especially if frequent is bad for health, particularly if the soil is at all contaminated.

Buchanan pointed out that a sudden fall in level of sub-soil water was most favourable for the pollution of wells by a filthy soil. (At Nunnick, Pettenkofer pointed out that a fall coincides with max. prevalence of typhoid)

Fodor found that the mortality from typhoid in Buda Pesth was greater in those houses where the ground water was more impure and where the ground was more polluted with organic matter

A Lessi (Cbltt. für Bact. 1894) found that guinea pigs exposed to the effluvia of corpses succumbed to the effects of pathogenic cultures of B. ac. Typh. while but one effect in animals of the same age kept under more favourable conditions

Parlor Pestilence

In campaigning in Mexico, Central America, Africa, West Coast, Congo, and Uganda the Jigger flea may be met with to cause great suffering to the soldiers. It is most common in hot weather, or rainy, because at such time the fleas come into the houses for shelter. It particularly affects dirty huts & piggeries. It attacked the French troops who dwelt in the plains and in Native huts during the Mexican campaign. New comers suffer most.

Parkes Memorial Prize.

Subject "On the Prevention of Disease amongst Armies engaged in Active Operations in the Field with Special Reference to the Sanitary Organization of a Field Force."

To Secy, Parkes Memorial Fund,
R. V. Hospl. Netley.

before 31 Dec. 1903.

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