On a new method of treating wounds, (Gruby's system) and the medical and surgical aspects of the siege of Paris : outlines for a non-official report (mémoires pour servir) to the physician to the Rt. Hon. the Minister of State for India : (including investigations concerning pyaemia, the danger of the introduction of calf vaccination into our Indian possessions, the tent-hospital system, &c.;) / by Cameron J.F. Stuart Macdowall.

ON A

NEW METHOD OF TREATING WOUNDS,

(GRUBY'S SYSTEM)

AND THE

MEDICAL AND SURGICAL ASPECTS

OF THE

SIEGE OF PARIS;

OUTLINES FOR A NON-OFFICIAL REPORT

(*MÉMOIRES POUR SERVIR*)

TO THE

Physician to the Rt. Hon. the Minister of State for India.

(INCLUDING INVESTIGATIONS CONCERNING PYÆMIA, THE DANGER OF THE INTRODUCTION OF CALF VACCINATION INTO OUR INDIAN POSSESSIONS, THE TENT-HOSPITAL SYSTEM, &c.)

BY

CAMERON J. F. STUART MACDOWALL,

SURGEON INDIAN ARMY, 3RD BOMBAY LIGHT CAVALRY,

(PRESENT DURING THE WHOLE OF THE SIEGE.)

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ERRATA TO

"On a New Method of Treating Wounds, &c."

Page 8, line 4 from the bottom, for "*of*" read "*after.*"

„ 11, to make the sense clearer insert :— * "And human virus is difficult to implant on the calf," before the note * at the bottom of the page.

„ 13, line 11, for "*sixteen*" read "*fifty.*"

„ 20, „ 12, for "Cubic *feet*" read "Cubic *mêtres.*"

A NON-OFFICIAL REPORT.

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The importance, in a sanitary point of view, to the vast populations of India (and to our admirably-organised *Indian Vaccination* Department) of knowing the truth with regard to calf-vaccination, so much practised in France, and which — having been introduced into England— threatens to be imported into our Indian possessions, where the native mind would too easily lean towards its adoption; the connection (Ricord's theory) between the spread of *smallpox* (inseparable from anything which affects vaccination) and *pyæmia*, which has carried off in round numbers nine-tenths of *all amputations* performed in Paris; the study of the theories as to this truly fearful complication of all military surgery; the investigation as to whether mere cubic space of air, and change thereof, is sufficient to prevent it; these three points alone seem to make it peculiarly desirable for the Indian Government to know all that possibly can be learnt on the subjects of this report. I have no doubt that the reports of Drs. Gordon and Wyat* will be supplied to the Indian authorities; but, in the meantime, I think it my duty to assist, as much as I can, *especially the true ventilation of the question of animal vaccination*, which these gentlemen may not have studied, as being less interesting to the army (where vaccination is carefully carried out) than it must be to our Indian, civil, and military populations, where it is so difficult to render

* Drs. Gordon and Wyat (since created Chevaliers of the Legion of Honour), two distinguished medical officers, were sent to Paris by the War Office. It was therefore, I presume, not deemed necessary to send medical commissioners from the Indian army. I had no *official* facilities for obtaining information in consequence.

human vaccination effective, owing to the vast numbers of individuals which it has to embrace, and as to which our European army is but as a drop in an ocean. If animal, instead of human, vaccination be largely practised in India, I have no hesitation in saying that *all* trustworthy written evidence (both academic and official) tends distinctly to show that it will lead to an inevitable and prodigious increase in the number and violence of epidemics of small-pox, to the exhaustion of the human vaccine, and to the weakening of the effects of even good vaccine.

It is evident, therefore, that no other excuse is required for writing this crude paper on sanitary matters. Indeed, it would appear that even *spontaneous* "vaccinia" in a calf, so rare now-a-days, so easily found in Jenner's time, is difficult to communicate to the human subject, and only acquires its strength when it has become naturalised, as it were, in the human subject; the already weak vaccine from a child's arm, given to a calf loses all its virtues; in fact, the calf is proof against it in nine times out of ten—it only causes a *common sore*. This is propagated, and the terrible deception begins, the ultimate effects of which no one can calculate.

I now proceed to the arrangement of the report.

Having been confined to bed with dysentery* at the time of the investment of Paris, it was impossible for me to gather, during *that* period of illness, much information concerning the existence of medical or surgical epidemics. At a later period, when I found that it was impossible for

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* I was attacked with dysentery only on my arrival in Europe—slight *diarrhœa* at Alexandria. I came home for an affection of the sight. Strange to say, soon after the cold weather began, and when I was feeding exclusively on horse flesh, I *steadily improved* in health until the ration was reduced to 300 grammes a day. Strange to say, also, my first good dinner after the armistice made me quite sick, and caused me to vomit, although eating slowly and with excellent appetite. The only medicines that *did me good were 2 drachm* doses (4 to 6 grammes) of bismuth with quince syrup, *ter. die.*

me to leave the place, I gave my humble services for the cause of suffering humanity, as an unpaid medical volunteer with the war-companies of the National Guard. Active medical occupations and frequent absences in the trenches, the forts, outposts, and redoubts of the besieged city, rendered it almost impossible for me, amid the turmoil of the bivouac, to follow very accurately and continuously the practice of the regimental and civil hospitals and the ambulances of Paris. Nevertheless, when occasion offered, and on my periodical returns to the town, I made it my duty to visit these, to inquire into the practice pursued, the march of mortality, and the organisation of the army and hospitals. In the battalion to which I attached myself I became acquainted with the organisation of the regimental medical system—a system which, with the exception of some excellent points, I must mention with unqualified disapproval. This in no way applies to the medical staff themselves—a class of highly-educated and zealous men; but to the limitation of the functions which they are allowed to perform—a limitation which crushes their utility, and almost puts a stop to their progress in clinical knowledge; which renders them the subordinates, not of their immediate medical superiors, or of their regimental commanding officers, but of what is called the "Intendance Militaire," or Commissariat, a very worthy body in itself, but as incapable of guiding the medical department of an army as the surgeons would be of organising the Commissariat.*

The following remarks will therefore naturally class themselves under two distinct heads: First, sickness and mortality, both in the civil and military population,

* It will suffice here to mention an occurrence which took place at the sortie in November, across the Marne. As many as forty staff surgeons, with ambulances, carts, stretchers, &c. &c. were kept all day long, by order of the Intendance, on a plateau, whilst wounded and dying literally *died outright* for want of their services. On *subsequent* occasions many surgeons moved rapidly to the front *without orders*, and were of course welcomed and useful.

including treatment. Secondly, organisation, both in the army medical department and the military and civil hospitals.

It must be premised that, as far as the statistics of the army go, it will be only after a lapse of a year and a half, or two years, that the statistics of the war will be made public. What little information I have been able to acquire has been (as before stated) from the efforts of personal friends, viz. surgeons, who have given me the results of their own hospital practice, and which do not show, of course, the ratio to the strength of the corps to which their sick belonged. The registrar's bulletin "hebdomadaire" shows the mortality in the civil and, roughly, in the military population; it will be found further on in this report.*

It is certain that the number of deaths in 1870 were more numerous than in 1869. In ordinary times the deaths per week were about 800. This gradually increased since October to the enormous cypher of 4,671 per *week*, and in January and February, 1871, the number again increased. As the mortality amongst the soldiers is certainly always much greater than amongst the civil population, including in winter numerous deaths from frost-bite as well as in combat, there is little doubt that the army lost in proportion a good third more than this, for the registrar assured me that their returns were very provisional and approximative as yet.†

Two very salient facts arrest the attention in looking at the mortality of the civil and military populations of Paris and the immediate environs. First, the mortality from *small-pox* (average—latterly—246 per week) amongst the former;

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* I have condensed all the weekly returns I could get at the Hôtel de Ville into two, and given the percentages worked out from them.

† A really fine statistical document is published *monthly*, but it is in arrear always of six months, as most statistical documents generally are.

secondly, the fearful losses from what the French call "infection purulente," and which we call, almost as unsatisfactorily, "pyæmia."

With regard to smallpox, the weekly mortality is seen in the annexed condensation of the bulletins hebdomadaires, being an average of—latterly—246 fatal cases per week. The practice of *vaccinating* a *calf*, and afterwards vaccinating *children from* the animal, seems to have had a good deal to do with the permanent weakening of the genuine "Jennerian" vaccine matter, as the French very complimentarily call it in honour of the discoverer. As very erroneous opinions seem to exist on this subject even in England, where of late years calf-vaccination seems to have been to some degree practised, and as the subject is one of great interest in our *Indian Empire*, I have made it my duty to endeavour to arrive at the truth of the whole matter, to examine patiently the results of experiments, and to chronicle the opinions of those who have given the system a fair trial. I have registered their deliberate and unbiassed opinion, and the unimpeachably exact results of their practice. It will be seen that there would be no slight danger of doing irreparable mischief in India (where the native mind would be sure to lean towards calf-vaccination) if this system were ever introduced, instead of the arm-to-arm vaccination, which alone can safely guarantee from smallpox (if properly performed and with *good* matter).

It had at last become a fixed belief in France that the vaccine matter had become "*weakened*"; that the frequent cases of smallpox were consequent on the degeneration of the true virus of vaccine, and not because the operation was badly performed, &c. In short, vaccination began to fall into *disrepute** for many reasons. *First*, because possibly in many cases the virus *was* weak, that is, was

* My friend Dr. Piojey, Chevalier of the Legion of Honour, told me of fifty cases of smallpox in his ambulance, *none* of whom had ever been vaccinated.

(and always has been in *some* cases) a spurious virus. *Secondly*, when the virus was good, the operation was badly performed by midwives, &c., who never saw their patients more than *once*, and consequently many mothers thought their children vaccinated who were really not so. *Thirdly*, because *diseases* were said to be transmitted with the vaccine matter. And, indeed, certain ugly sores had appeared, instead of healthy pustules, on the arms of many men of regiments in the south of France.

Now, it has been proved before the Academy that when the lancet does *not* draw *blood* from the *pustule* which furnishes the vaccine matter, no other disease is ever transmitted to the healthy arm but the vaccine disease itself. If *blood* be drawn *with* the vaccine matter, and inserted into the arm of a healthy person, both a bad vaccination and the inoculation of contagious disorders *may* be the result. This is very rare, and ordinary precautions are sufficient. Vaccine pustules must not be squeezed in taking out the matter, or simple serosity and blood are also expressed on the surface, and much epithelium is found. As in everything else, the *juste milieu* is best. The child must not be too young or too old.

To obviate all these difficulties and dangers, it was proposed to vaccinate a cow-calf with good healthy matter, or to find a cow-calf with the original vaccine disease *spontaneously* developed on its teats, and to vaccinate children therefrom. (I wonder that inoculating *smallpox* on the calf was not tried; would not this produce in the calf a disease identical with Vaccinia?)

Messrs. De Paul and Lanois vaccinated immense numbers of people from the cow, and made large sums of money thereby.

Let it first be premised that no case of revaccination with human virus ever occurred after a lapse of twelve days out of 3,000 cases. Three cases occurred, however, within a few days of the operation, and were fatal. They

were cases where the diseases—smallpox and vaccinia—were simultaneous; the former preceding the latter probably, and being in a state of incubation. This period is much longer than we would suppose; a child born in a house where its sister was ill with smallpox—the mother being already pitted of old with the disease—was immediately (Dr. Fillette, Medical Conference, Paris, 15th June, 1870), even before the cord was cut, vaccinated (from *glasses*, however). Nevertheless, although the pustules seemed to progress pretty well, on the twelfth day smallpox appeared, confluent and fatal. It is generally about the *twelfth* day or the *fourteenth* after being exposed to the contagion that the disease begins. Vaccination sometimes seems to modify the disease and render it less fatal even after the contagion has been certainly contracted. (Dr. Dagand, ditto.)

Dr. Quinquand had one-third successful cases with the virus from the calf, but ALL his cases were successful with virus from a child's arm (Jennerian vaccine, as the French complimentarily call it).

Dr. Thevenot with calf-vaccine had only *two* successes in twenty-one cases!

On the Orleans Railway, all the surgeons sent reports to their chief, Dr. Gallard. *All* of them found that human arm-to-arm vaccination stopped the ravages of the disease, and that of the protected very few had anything but what is called varioloid diseases. One case only thus protected died. Thirty-two surgeons thus sent in reports on the vaccination from the calf. *One* says that vaccine from the calf became much better after transmission through the arms of three or four children, though bad and difficult to introduce the first time. The rest (thirty-one) found vaccination from the calf most provokingly unsuccessful, succeeding at the very utmost only in a fourth of the children vaccinated directly, and *much* less from calf-virus-tubes, or glasses. The vaccine pustules were always small, and contained little real

matter and much epithelium. The fifth day is recommended for collecting the calf-virus. Calf-virus which has *spontaneously* appeared on the animal has been found to be better than that which is inoculated—given to the calf from a child's arm. It is a rare disease, however, amongst the herds, and it is difficult to find a single case. I ask, again, is not the vaccine disease a *smallpox, modified by its passage through the cow?* If so, would it not be well to inoculate perseveringly the teats of the cow with real *smallpox* until the disease called vaccine appear? Has this been perseveringly tried?

To return to calf-virus, Dr. Vallot (*Gazette des Hopitaux*) says: "The matter of the calf sent me by the Academy entirely failed."

Dr. Lalagade: "I never succeeded once with the calf-virus sent me by the Academy." He did afterwards with matter from a calf with the spontaneous disease.

Dr. Pomarel directly from the calf succeeded in children; failed with adults.

Dr. Miguel: "The calf-virus which you sent me is useless."

Dr. Caril: "Not having succeeded with calf-virus."

Dr. Maury, with calf-virus transmitted to a *child* vaccinated from this child, and *succeeded* twenty-four times out of forty-three.

Dr. Faton: "The calf-virus sent from Paris by Dr. Lanois, and only four days old, failed *completely* (*echoua complètement*)."

Dr. Jollet: "The calf-virus, which I have carefully followed in its operations, gave always most ludicrous results (*dérisoires*)."

Dr. Aussat: With calf-virus, results nil.

Dr. Picard: Ditto.

Dr. Diard: Ditto.

Dr. Guerincan: Ditto.

Dr. Huguel: Ditto.

Dr. Lacombe: Ditto.

Dr. Besnard : Complete failure with the calf-virus, &c. &c.

Dr. Gaillard : With Jennerian vaccine 2,740 successful out of 2,856. But with calf-vaccine 170 successful out of 283 children. Revaccinations, 126 successes out of 522.

It is asserted that calf-virus gets stronger (?) the oftener it is passed through children ; that is, that it is difficult* to implant, and is probably quite ineffacious also at first. "It is this calf-vaccine so weak in itself *which has caused the degeneration of the real Jennerian virus.* We must return to it. Vaccine from a child of six weeks is bad vaccine ; wait till four or five months, and no purer vaccine can be had, for *no* child, who has not shown contagious (syphilitic, &c. &c.) maladies before this, is afflicted with them."—(Dr. Bouchut.)

Messrs. Garecki and Ruaux, house-surgeons of La Charité, described after the hæmorrhagic primary, hæmorrhagic secondary, and the variolous rash, a fourth variety, which, from their description, I shall call the Bullœferous variety ; it occurs at the period of maturation ; the patient is hideous with "sero-sanguinolent phlyctenœ, as large as blisters ; one expects gangrene, but the fever abates, the appetite returns, and the cure is rapid."

The reasons for the failure of vaccination from calf-virus are obvious. The spontaneous disease is rare, and is not easily communicable to other calves or to children, and spurious pustules are formed not very easily distinguishable from real ones. Besides, the passage through the calf (which *takes* the disease with so much *difficulty*) probably weakens the virus (already often weak) which is implanted

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* Even with vaccine which is successful on children. The calf's teat must be clean shaved at the base, near the inguinal fold. An induration forms, not quite a pustule. "From the fourth to the eighth day this is scratched with the lancet to extract it with pressure." (?)

into its teats from a child's arm. The inexorable logic of facts have hitherto proved the above statement.

Again, if vaccinia in the calf be only a modified smallpox (Jenner, Bennet, &c. &c.), if the calf can modify smallpox, how much more easily will it not modify a modified smallpox, either from an affected calf or child?

I now proceed to the subject of Pyæmia.

PYÆMIA AND HOSPITAL GANGRENE.

The mortality from pyæmia and gangrene amongst the wounded and amputated during the siege of Paris is known to have been greater than has ever occurred before in the annals of military surgery. Nearly two years will probably elapse before official returns and the expected great work of Dr. Chenu, C.B., &c., shall enlighten us as to the exact statistics of these maladies. But some approximation to a knowledge of their ravages can be obtained from other sources; and the remarkable results obtained by particular modes of treatment give us perhaps some clue to their etiology. I hope at some future time to be able to furnish fuller information on the subject, as I am still expecting promised documents from Paris.

Dr. J. Worms, the "Inspecteur of the Service Medicale" (Sanitary Commissioner), told me *vivâ voce* that: "in round numbers *all* the cases of amputation in the last few weeks of the siege *died;* that the case was the same with nearly *all* the wounded who were not operated upon, and that the deaths were almost all from infection purulente." He added that "a distinguished friend of his had utterly renounced operating, as he invariably lost even the apparently most favourable cases calling for such interference."

Dr. Demarquay, one of the best operators I have ever seen, and a most distinguished man of science, told me that "he had not succeeded in saving a *single case* of amputation at the newly planned and constructed wooden hut-hospital at Passy."

Even at the American tent-ambulance, as will be shown further on, and which will be seen to be almost the open-air treatment, Dr. Swinburne told me (complainingly !) in anticipation of exact statistics, that he had only saved three amputations of the thigh out of seven cases; three cases of resection of the elbow out of five, and about the same proportion of amputations of the leg. But three out of seven cases of compound fracture of the thigh recovered also by conservative surgery, one being of the neck of the femur.

In the Hôtel Dieu all amputations of the thigh died, but Dr. Maisonneuve by conservative surgery saved sixteen cases of severe wounds out of sixty-six. At the Jesuits' Hospital at Vaugirard he was even more successful.

But I subjoin my notes taken on the spot, generally from the surgeons' own mouths.

AMERICAN AMBULANCE.—TENTS.

The tents are heated by a pipe of common sheet-iron which runs under the boarded floor. The boards are laid side by side on traverses, but not quite touching each other. The stove is a simple brick and mud furnace, sunk into the ground outside the tent at one end. The tube passes under the whole length of the floor, and ends in a common sheet-iron chimney at the other extremity of the tent.

The tents are about 30 feet long and 20 broad, exactly the shape of a cottage, and are laced to each other, gable-end on, so as to form blocks of four or six tents. The end walls of each intervening tent form a screen to separate the sick during operations, death, &c. These end walls open up in the middle like a curtain. The height of the ridge poles (singularly light) is about 15 feet, and of the side walls about 6 feet. There are double flies. It has rained incessantly these days past; not a drop has penetrated. These tents resemble large and rather flat-roofed Indian "rowties" or hill tents. Duck is good for Europe or the States, but is, as we know, quite insufficient

under an Indian sun, and our thick four-fold cotton ones alone can prevent sunstroke; but the shape is excellent. The walls are supported, like "bichauba tents," by poles.

150 beds; 260 admissions. No pyæmia (?). Only one case of erysipelas. No gangrene. No scurvy (?). 13 deaths in all up to *now* (February). (Up to November, only 2 deaths out of 62 admissions, one of them from tetanus.) Dressed with finely-picked and carded oakum and nitric acid lotion. The deaths were, 4 amputations of thigh (out of 7 operated on), 1 with symptoms of tetanus, 2 of exhaustion (?), 1 gastritis (?). No purulent deposits in viscera (?); (post-mortems were *not* made). 2 cases of resection of elbow died (*out* of 5 operated), both secondary operations. 2 amputations of leg from exhaustion (?), one with *rigors*. 1 compound fracture of ankle-joint died; he had lately had smallpox. 1 of bullet through the liver died; 1 ditto through abdomen. 1 case of ball through lungs, grazing liver, died; and 1 ditto through lung; all from exhaustion (?). Of the recoveries, there were 3 out of 7 amputations of thigh, 3 resections of elbow out of 5,* and *several* amputations of the leg. 3 out of 7 compound fractures of thigh recovered, 1 through neck of femur opening hip-joint. 3 of compound fracture of ankle recovered out of 4. One of the recoveries with visceral wounds had two ribs broken and chest opened.

HOTEL DIEU (THREE WARDS ONLY).

All amputations of thigh died. In Maisonneuve's ward, 66 cases (conservative surgery). No amputations. 4 deaths from pyæmia, with visceral abscesses. 12 from their wounds alone (5 of these thoracic).

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* 6 out of 12 recorded operations = 50 per cent. I could not get the exact returns of all the cases. The success in the thigh amputations was remarkable.

CORPS LEGISLATIF.

105 beds; 200 cases admitted; 9 amputations; 5 died; 1 *thigh*, 1 leg, and 2 arms recovered; 10 cases of wounded died: Total 20. Carbolic acid lotion treatment, and disinfection.

ITALIAN AMBULANCE.

Forty beds; *two deaths in 200 treated* (*not* good accommodation as to site, &c.). Among cured I *saw* one case of ball through ankle-joint, one through shoulder ditto. 16 waggons; 160 men. This ambulance corps conveyed immense numbers of sick and wounded to *other* hospitals and ambulances. OIL AND COTTON-WOOL TREATMENT OF GRUBY.* Conservative surgery exclusively. (I am promised full details.)

SOCIÉTÉ INTERNATIONALE OF GENEVA (DR. CHENU, ETC.).

At first, in Exhibition Building; *326 mètres cubes* to *each* bed; much pyæmia. In Grand Hotel *only 35 cubic mètres* (1 mètre 50 centimes between each bed); LESS PYÆMIA, about 30 getting well. Dr. Bidard has a case of amputation of the thigh getting well, Dr. Vidal one, and another surgeon saved one: all other thigh amputations whatever *died*. Two cases of penetration of the knee recovered (Messrs. Vidal and Bidard one each). Dr. Guillon lost almost all amputations also.

WOODEN HUT–AMBULANCES DE LA PRESSE AT PASSY (RICORD, DEMARQUAY, ETC.).

Assisted in all about 20,000; *lodged* 2,000 wounded. At Passy 1,400 square feet to each bed. M. Demarquay,

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* For details of this treatment, see "Remarks" further on.

with great frankness, told me that both at the Tuileries and here he had lost *all* his cases of amputation through pyæmia, &c. I saw a case of his of resection of knee-joint getting well and two of elbow-joint ditto. About 400 cases now in the barracks.

The huts were built on the most approved new plan, 21 in number (20 beds in each). The height was 8 mètres; length, 30 mètres; width, 10 mètres. There was a lantern roof running the whole length of the building for ventilation and light, with practicable windows. The urinals, &c., constantly disinfected, were of slate and porcelain, and the ordure was carried away in closed vessels. All seemed perfectly sweet, except the room for soiled sheets, pillow-cases, &c. (temporarily used before transporting the foul linen to laundry). The barracks are too close to each other, however. The distance is not twice the height, only about *once*. Papering is on the inner walls to half the height, which seemed to me to interfere with the infiltration of air (through fissures, joints, and cracks in the planking) so usefully supplied by the interstices of the cloth in tents.

PALACE OF THE LUXEMBOURG.

400 beds were at first in barracks (21 beds in each) in the park; 8 mètres high and 30 mètres long, 10 wide, with a lantern roof running the whole length for ventilation, &c. Barracks much too close. Shells drove the patients into the palace. Only 93 cases of *wounds* (gunshot); 3 deaths (out of these 93) occurred, 2 of them were amputations. All died of pyæmia. Other statistics not yet obtainable. These are probably only approximative.

VAL DE GRACE.

The largest and finest military intramural hospital in Paris, perhaps in Europe. Splendid grounds on the culminating point of town; buildings well detached; 50 to

60 cubic mètres to each bed; *can* accommodate 2,000 sick; 800 are usually in the house. About 1,800 sick and wounded have been treated since the siege. Conservative surgery has generally proved a *failure;* even the civil surgeons who were employed as "*extraordinary* officers" came to this conclusion. Dr., or rather Assistant-Surgeon Mounier, son of the distinguished surgeon-in-chief, amputated fifteen times: (of these amputations two were disarticulations of the shoulder-joint,) nine recovered (this is *authentic*), being about 60 per cent.! The other surgeons of the establishment were less successful, but an average of 50 per cent. of amputations *recovered*, which is better, probably, than any civil hospital establishment can boast.* There were ten cases of pyæmia with metastatic abscesses, all fatal. There was *no hospital gangrene* and no erysipelas; indeed, the hospital is admirably managed both by the religious sisters and by the medical and military authorities. Official statistics will appear soon.

"*Ambulance of Clichy and its annexes, from 23rd Sept.*, 1870, *to 7th Feb.*, 1871.

"Admissions, sick and slightly wounded ... 4,721

"Deaths 382

"Of these 1,156 were cases of smallpox, and 117 of them died.

"No amputations, no pyæmia. Many frost-bites. Local cases of congelation got well. General, diffuse congelation, three cases; all died with symptoms of torpor and asphyxia.

"Erysipelas did not prevent many recoveries from smallpox, nor did large burrowing abscesses. The majority of the deaths were from the hæmorrhagic form of the disease."
—*Dr. Piojey.*

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* Not even excepting perhaps the American Ambulance, if we take Assistant-Surgeon Mounier's 60 per cent. of successful amputations. But it is fair to say that the American average, 50 per cent., is that of seven amputations of the *thigh* and five *resections* of elbow —all *very* serious cases.

REMARKS.

It will be seen from these notes that pyæmia was the almost universal cause of death in all the wounded, and was so without exception in amputations even at the American tent-ambulance. For where a *post-mortem* examination is not made it is almost impossible to deny the presence of metastatic abscesses in the lungs, liver, &c. I hope to be able to give correct statistics at some future date. We shall examine further on the probable causes of the greater success in treatment at some establishments than at others.

First, we must carefully distinguish "infection purulente" —pyæmia—from hospital gangrene. Secondly, we must distinguish one form of pyæmia (*septicæmia*) from another form of the malady accompanied by metastatic abscesses. The one is a rapidly increasing typhoid state from a general *poisoning* of the blood, ending in a few days in death; the other a succession of rigors and hectic fever, followed by suppuration in the viscera or limbs. Both are accompanied by a grey ashy appearance of the wound, and by an unmistakeable and peculiar smell. So also is hospital ulceration or gangrene proper. It has been proved by many experimentalists (see Bennett's "Clinical Lectures") that the injection of laudable pus into the veins of animals (large quantities, half a pint and more) such as horses, asses, &c., does not necessarily cause either gangrene or metastatic abscesses. Notwithstanding that experiments on animals have not the same weight as those performed on man, this fact should not be lost sight of. It would indeed appear that the mere presence of *pus* in the blood is not capable of producing typhoid symptoms and metastatic abscesses, or the daily cases of reabsorption of purulent matter in ordinary civil practice would *always*

be followed by such. Is not the exudation in pneumonia often reabsorbed and eliminated in this way? The idea that abscess in the liver in India is always preceded by pus-producing ulceration in the intestines, is quite exploded and disproved. Besides, in metastatic abscesses pus is not very easily discovered in the veins (although probably there), unless phlebitis be present; and as we cannot suppose that the absorbents and veins do not continue to act in cases that get *well*, in the same way that they do in cases that *die* of pyæmia, mere absorption of *pus* will *not* account for the disease.

Dr. Ricord, in a most interesting conversation which I held with the distinguished Professor, told me that in the new large, well-ventilated, wooden-hut hospital erected on one of the most healthy spots in Passy, pyæmia caused fearful ravages; that one or two patients in a room, large enough for *twenty beds*, by no means escaped the disease, although certainly less liable to it (as in all contagious maladies) than when crowded.

The great syphilographer described to me, in excellent English, his belief that one powerful—the most powerful—cause of the disease is the prevailing *variolous or small-pox-poisoning* of the atmosphere, &c.; a *pyogenic* influence at *all times*, and producing a pyogenic *diathesis* (if not small-pox) in those who are protected by vaccination. He by no means denies the influence of other causes of the disease, such as crowding, bad hygienic conditions of all sorts, and (with Nelaton) osteo-myelitis, but he believes firmly in the variolic influence, as having a great deal to do with a large proportion of the cases.

The great surgeon Nelaton affirms that osteo-myelitis (a pathological alteration in bone, in its membranes, and chiefly in the marrow) has much to do with the disease. But as successful cases of fractures and amputations at all times are accompanied by division of bone, its membrane and contents, it must only be in cases where jolting in

ambulance-waggons and delay in operating obtain, that this pathological condition probably arises. I therefore maintain that amputation should, if possible, always take place near the field of battle, that *one* operating tent, &c. could serve for large bodies of men, and could almost always be put up in a safe place. *Well-bandaged* amputation cases are easily transportable.

Has not scurvy something to do with pyæmia?

That crowding alone will not account for it seems to be demonstrated at the Palais de l'Industrie, where Dr. Chenu, C.B., President of the Medical Committee of the International Society, told me that, with 326 cubic feet of air per bed, pyæmia was very much more frequent than at the Grand Hotel to which the patients were moved afterwards, and in which each had had only thirty-five cubic mètres of air. In the Palais de l'Industrie the rooms were enormous and lofty, about the height of an ordinary second storey (in London) from the pavement, but I think the air was rather stagnant.

The wards were on the first floor—not on the ground. Nevertheless the ground floor is used, at the period of Exhibitions, for storing cheeses, and provisions of all kinds, animal and vegetable, stalling prize cattle, &c. &c. Besides, although the cubic space of air was quite in excess of that ever seen in hospitals or barracks, its very extent prevented its easy *renewal*. The means for effecting this were only such temporary measures as could be adopted in a building never intended for a hospital. Nevertheless the astounding fact remains that pyæmia and hospital gangrene were *exceptionally and unprecedentedly fatal* in a building where there were 326 *cubic mètres of air to each bed*, and this not at the *end* of the siege.

Scurvy is appearing *now* in Paris. The French surgeons certainly did not find many typical cases at the time of the great mortality from pyæmia, &c.; but we know that the scorbutic diathesis exists long before the gums are affected.

Slight ulceration and an aphthous state of the mouth I saw frequently in January, 1871.*

Dr. Gruby, the eminent histologist and practitioner, has long been of opinion that charpie—*old linen*† fretted out by *hand*—is a real nest for animal and vegetable germs. He has long taught that the exclusion of the atmosphere‡ is an important element in the prevention of hospital gangrene, &c. &c., and he has sought to get rid of microscopic or even invisible germs by the use of oil and cotton-wool dressing. He has practised this for many years, and his certainly remarkable success in conservative surgery at the Ambulance Italienne seems to confirm some of his views. Oil is known to be destructive of germs, cotton acts as a filter even of the atmosphere, and the union of both forms not simply an imbibition, but a real *mixture.* If a piece of cotton be dipped into oil and held up against the light, not only a drop will be seen to depend from it, but a transparent *cylinder* or *column* will gradually form and elongate itself, in which (on forcible disrupture) the exquisitely fine fibres of cotton will be found intermixed and carried down. This intimate admixture of the oil and cotton fibre (a perfectly clean non-fermented and non-*manipulated* vegetable fibre) forms a packing, as it were, to all the interstices of a wound ; it insinuates itself gradually into all the corners,

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* The French soldier is underfed, and I believe that soup may almost be said to be the ruin of the French army. It takes at least four hours to make and much albumen is lost in skimming the pot. Hot coffee or tea, with meat, cold or roasted, broiled or "braisé," should alone be tolerated on marching-days.

† The flax from which linen (often foul) is made is, as he points out, already subjected to *fermentation*, and in *water*. *Fermentation* is, probably enough, a germination of a low type. Dr. Gruby objects to water (unless boiled previously) even in the washing of wounds. He as much as possible removes dirt, coagula, &c., with dry or slightly oil-moistened cotton wool.

‡ Dr. Guerin has invented an admirable apparatus for *this* purpose.

and nooks, and crannies; the oil carrying with it perhaps only one fibre, or even none at all (where its passage is impossible). Here another principle comes into play. When oil comes into contact with albumen, it is well known that they, especially if motion be present, form an emulsion, that the oil is separated into globules, each covered with a fine pelicle of albumen. Dr. Gruby maintains that in a wound there is always sufficient motion for this. First, there is the constant beat of neighbouring arteries; there is the motion through the capillaries, which must cause some commotion, however imperceptible; and there is the vermicular and involuntary motion in muscle almost constantly going on. Indeed, in all the wounds I have seen dressed by this method, I have distinctly seen an emulsion formed; the secretion of pus has been very moderate in quantity, and there has been (even on holding a twenty-four hours' dressing close to the nostrils) no offensive smell whatever. A pad of cotton is placed over the pellets imbibed with oil, and, being bandaged, it is to be remarked that motion on the outer surface of the pad does not necessarily affect those portions of oiled cotton sticking in the wound.*

In India, where lint is so great a source of expenditure to the State, and where cotton is abundant and cheap, where grain-oils (such as sesame-seed oil, &c. &c.) are not expensive, this mode of dressing wounds, from which I have witnessed some wonderful cures, seems to be peculiarly applicable. Not a single case of pyæmia or gangrene occurred amongst Dr. Gruby's patients.

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* This probably accounts for the fact that all the patients I saw told me that they had never suffered any *pain*, to speak of, from first to last.

A GLANCE AT THE MEDICAL ORGANISATION IN THE ARMY AND AMBULANCES.

In a regiment, the surgeon visits the barrack-rooms before morning report (to commandant at orderly-room). He receives at the office, or orderly-room, tickets, or small company-books—left there for him by each sergeant—on which the men who have reported sick are inscribed (by the sergeant). He then proceeds to the respective dormitories in turn, and with the sergeant's help examines the sick. He has thus an opportunity of ordering the ventilation of the salle, opening windows, seeing as to its cleanliness, &c. &c. It is impossible for him, however, to diagnose a case *properly*, either by auscultation or percussion, under these circumstances, in an immense room where work of all sorts—washing, cleaning of accoutrements, brushing of clothes and boots, making the beds, sweeping the floor, &c. &c.—is going on, even if silence at the word "Attention!" were possible—which it is not. Besides, the *daily* inspection of barracks is a duty which should not fall to a medical officer, whose orders, there, can only be carried out through the captains in a roundabout way,—and seldom are. A soldier will open a window for the surgeon out of politeness; but he will shut it again as soon as he is gone, if he choose. Again, the quartermasters, captains, sergeants, &c., are almost daily in the salle, for the very same purpose. However, there is much to be said in favour of the morning visit of the surgeon to each barrack-room. It would be impossible in India, where the large splendid barracks occupy a large area of ground. The visit could not be finished before evening. The diseases which the surgeon is allowed to treat in the dormitories or regimental infirmaries are chiefly scabies (if not inveterate) and gonorrhœa; visceral affections only when *un*accompanied by fever, or when *not* of a contagious nature, and

slight wounds or trifling skin diseases; in fact, every serious case—any real case of disease—must be packed off at once to the large military hospitals. In this way the surgeon who remains with a regiment, although he must have studied for years at the military school of Strasbourg, and pass competitive examinations of great difficulty, becomes a mere registering clerk—not even a clinical clerk, be it observed—for he can never follow the march of a single serious case to the end. He has no opportunities of acquiring clinical knowledge, whether surgical or medical, and very soon forgets what he knew, and the officers and men never think of consulting him or coming for his medical opinion. The morning, weekly, and monthly returns are as simple as possible in the National Guard, but in the Line they are vexatiously and, I think, needlessly numerous. In consequence, all returns and statistical documents are much in arrears.

AMBULANCE HAVERSACK.

Medicines, and a box of instruments (amputation), with means for dressing twenty-five wounds, splints, &c. are thus carried on the back of the hospital orderlies (two men per company). There is one sack of this description per battalion, independently of two mule-panniers, and the last model is perfect. Unfortunately old pattern ones are still much in use. It is an admirable thing if well-made and judiciously furnished, or fitted with useful medicines, such as pills and powders, instead of *fluids*, &c. It is astonishing what a comfort it is to have a man *beside* one on the field, with almost everything required for an emergency, in a haversack. There is a difficulty, however, which constantly arises, viz. the providing for the man's own private kit-haversack. This, of course, he could not carry as well, and we had to put in some of the carts the best way we could. The regimental hospital haversack is, however,

one of the most useful and best arrangements of the French army. There is no running about looking for the mules and mule-panniers, or waiting for their arrival. A hospital orderly (each in his turn ; there are two per company) carrying it, accompanies and stays by the surgeon during the whole action. In the Cavalry this sack is replaced by a valise. But as colonels think it hurts a horse's back it is necessarily changed from one cavalier to another, and is thus often carried by men who are not hospital orderlies.

MULE-PANNIERS.

The mule-panniers, or rather chests, for they are not the elegant wicker things known to us as such, are allowed in proportion of one pair per battalion. They also contain another amputating case* and means of dressing 200 wounds. (They are often carried in carriages, waggons.)

One single pattern of waggon is now ordered for the transport of hospital, commissariat, or other stores. They weigh 2,000 pounds, and at least 3,600 pounds when loaded. Mules, &c., are used for the transport of the contents in Algiers, where waggons are not so useful. All this constitutes what is called a light or flying hospital. As many as 364 mules are required for the ambulance of a corps of 10,000 men. Cavalry are, however, better followed by light carts than by mules, who, if they trot, smash everything to pieces. The proportion allowed is as follows :

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* Therefore that in the ambulance haversack, which is complained of as heavy, might be replaced by a single knife and light saw, with forceps, thread, &c. Every orderly should carry two tourniquets, I think, *handy*, and not *packed away*.

Designation of the Means of Transport, and of the Load.	Proportion allowed.			
	For Head-quarters.	For a Division of Infantry.	For a Division of Cavalry.	For a Park of Artillery.
Waggons with load complete	5	4	2	2
Ditto, to follow empty for emergency	1	1	1	1
Litter mules	15	10	5	2
Cacolet mules	30	20	10	5
Stretchers	50	40	20	6
Barrels of 50 litres	8	6	4	4
Blankets	25	20	10	10
Cotton sheets	16	10	6	6
Mattresses	8	5	3	3
Bags for straw	8	5	3	3
Cotton shirts	30	20	10	5

PERSONNEL.

The *personnel* is not nearly sufficient in the infantry regiments, thus:—

Designation of the Personnel.	Head-quarters Staff Hospital.	Staff of Division of Infantry Hospital.	Staff of Division of Cavalry Hospital.	Staff of Park of Reserve Artillery Hospital.	Regiment of 3 Battalions Infantry.	Regiment of Cavalry.	Battalion (large) of Chasseurs (rifles).
Principal Surgeon	1	—	—	—	—	—	—
Surgeons Major	2	1	1	1	1*	—	—
Asst.-Surgeons Major	4	3	3	—	2	2	2
Apothecaries Major	1	—	—	—	—	—	—
Asst. Do. Do.	2	1	1	1	1	1	1
Responsible Commissariat Officers	1	1	1	1	1	1	1
Adjutants of Commissariat	4	3	2	2	1	1	1
Infirmary Men	5	3	2	2	—	—	—
Infirmary Soldiers (Hospital Orderlies)	20	17	8	8	8†	8	8

* Indifferently a Surgeon or an Asst.-Surgeon Major.

† This depends much on commanding officer.

But, indeed, it will be seen that the regimental surgeons, one to about 1,000 men, are expected to send their sick and wounded to the large divisional and headquarter hospitals. I suppose I am too old to learn, but I cannot see the great advantage of this. It requires constant transport. It leads to secondary amputation ; it takes the soldier out of his regiment, and on a long, sometimes jolting trip—wounded and sick though he may be—amongst perfect strangers. The separate hospitals of regiments under a particular medical officer's charge should form in themselves the divisional and other hospitals, by *merely being assembled* together in one locality, and should only leave their wounded and sick in depôt hospitals, when the march *requires* their being left behind.

At the Grand Hotel, Baron Mundy held two conferences on the modes of transporting sick and wounded. He condemned all side-saddle chairs carried on horse or mule back as thus causing unavoidable jolting.* He had models of all sorts of hand-stretchers, wheel-stretchers, and wheeled carriages. The carriages of the American Ambulance were much praised, the German ones also; the New Zealand and Punjab hammock-stretchers were much liked, but he gave the preference to *wheeled carriages* with good springs and indiarubber stays, &c. They should open freely at the sides for depositing the wounded, and have *a step* all round to facilitate dressing the patient.

Baron Mundy's own model seemed to be the best. As for stretchers, surely (it appears to me) the simplest and lightest of common cheap stretchers, carried by two men, are all that are necessary and are the best for conveying the wounded to the wheeled carriage. A *number* of these can be rolled up and carried in the ambulance waggon or on the roof. This cannot be done with wheelbarrow stretchers, which are scarcely required thus at all, except

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* In mountain paths, however, they are necessary.

where there are no wheeled carriages. It requires at least two men to load a wheelbarrow-stretcher. It *jolts* over the uneven ground of battlefields, until it can reach the wheeled carriage, and when once there the wheeled spring vehicle renders it unnecessary. Hospitals and ambulances are treated of in the previous division of the subject—Pyæmia. But we may add, that besides the hospitals of the town (civil and military), there were numerous subscription ambulances, such as the Great International of Geneva, the immense Ambulances de la Presse (subscriptions collected by the Press), of the theatres, the American Ambulance, the English one, founded by Mr. R. Wallace, the Italian, the Belgian, private ones in convents, monasteries, families, &c. &c.

The Mayors of Paris also established numerous ambulances in their different districts (arrondissements), and also Ambulances de Rampart for the immediate relief of the wounded, sent from the ramparts by the surgeons of the National Guard. These last ambulances are all well paid by the respective municipalities or mayoralties. They are supplied with beds, stretchers, splints (chiefly of straw), bandages, medicine, &c. A first dressing is applied to the wound, and the patient is carried to the nearest *fixed* ambulance to be operated upon or permanently treated. The regiments of the line, &c. have also large fixed and moveable ambulances in the pay of the Military "Administration." The surgeons of the Regiments and National Guard accompany their battalions into action, and only stop hæmorrhage, apply splints, a bandage, &c., and superintend the despatch of the sick to the ambulances. The most eminent surgeons have given their services gratis to the ambulances.

The word or name "ambulance" is singularly misapplied, and moveable or flying ambulance is simply to be considered as tautological. Infirmary or hospital is the proper designation for all "fixed ambulances," and "move-

able hospitals" or simply "ambulances," for "Ambulances Volantes."

A very simple stretcher is in use, a straw mat exactly like an Indian "tattie," made of whisps of straw (instead of *fragrant roots*), the thickness of two fingers, which are tied, side by side, by three twines knotted between each whisp, and these twines, thus knotted, run the whole length of the mat, which is 7 feet long by 2½ broad. It can be rolled up like a roll of music, and is strengthened at every foot or two by sticks instead of whisps. Two light poles run under it into four loose strong twine loops, and the whole is lifted, with or without brace-straps, by two men. It is very light and cheap.

Tents, such as those at the American Ambulance, and light wooden barracks, are excellent for treating the wounded in; so also are open sheds as long as the weather will permit.

No ornamentation or outward luxury or expensive material ought to exist in temporary camp or field hospitals, for all experience tends to show that they *ought to be burnt down without remorse and at once, the moment that pyæmia or gangrene*, &c. may appear.

STATISTICAL NOTES

ON THE

MORTALITY FROM SICKNESS, COMBAT, BOMBARDMENT, &c.

I here give 2 tables compiled from the Registrar's weekly returns. The first (B) is the most important, as being constructed from the bulletins made during the bombardment by the new Registrar, Dr. Worms, on a new plan. Unfortunately he only once (one week) could get returns from the *army*, &c., or from all the *mobilised* National Guard. These, like the Army Returns, were sent, of course, to the War Office, and will appear in about two years. The accidents from bombardment are only those caused directly by shells or splinters, not by falling in of walls, &c., which were, of course, more numerous.

Drs. Gordon and Wyat will, I have no doubt, be able to furnish fuller details. These gentlemen were accredited to the French Government by our War Office. They had better official opportunities for obtaining information; they have both been made Chevaliers of the Legion of Honour.

(A.)

Specimen of Weekly Return, from which is compiled the annexed Table.

MAIRIE DE PARIS.

DIRECTION DES AFFAIRES MUNICIPALES.

2e Division.—2e Bureau.

Bulletin Hebdomadaire des décès déclarés à l'état civil du 28 janvier au 3 février, 1871.

CAUSES DE DECES.	Population civile d'après le recensement arrêté le 7 janvier 1871: 2,019,877 habitants — AGES				ARMEE. — Troupe de ligne et garde mobile.	TOTAUX.
	au-dessous de 1 an.	de 1 an à 15 ans.	de 15 ans à 50 ans.	de 15 ans et au-dessus.		
Variole	52	54	109	22	21	258
Scarlatine	...	7	6	...	4	17
Rougeole	1	19	1	...	8	29
Fièvre typhoïde	1	58	57	15	193	324
Erysipèle	6	1	2	3	...	12
Bronchite	112	139	96	166	114	627
Pneumonie	31	52	88	138	156	465
Diarrhée	57	38	11	43	1	150
Dysentérie	4	14	10	26	9	63
Cholérine	...	...	...	...	...	...
Angine couenneuse	3	9	3	1	...	16
Croup	2	6	...	...	...	8
Affections puerpérales	...	...	14	...	...	14
Affections chroniques et accidents divers.	447	301	594	916	134	2,392
Accidents de guerre:						
Combat	...	...	273*	14	...†	287
Bombardement	...	...	9	9	...	18
Totaux	716	695	1,269	1,353	638	4,671

Vu: *l'Inspecteur du Service médical,*
Dr. JULES WORMS.

* Does not include all the mobilised National Guards *outside* of the Paris ramparts.

† Not received.

Observations.—Le détail de ces causes de mort est indiqué dans le *Bulletin de Statistique municipale* publié mensuellement.

(B.)

Tabular Statement,

Compiled from the Weekly Returns given in at the "Mairie de Paris," from the 21st January to 17th February, 1871, inclusive.

(Four Weeks.)

Causes of Death.	Civil Population, according to Census taken 7th Jan. 1871, 2,019,877, including 300,000 National Guards.				Total.	Percentage of Deaths on Civil Population.	Army.		Grand Totals, Civil & Army.	
	Under 1 year.	From 1 year to 15 years.	From 15 years to 50 years.	Above 50 years.			Line and Mobiles (say) 55,000.	Percent. of Deaths.	Deaths.	Percent. Population & Army.
Smallpox	165	159	503	70	897	·044	87	·158	984	·049
Scarlatina	1	20	10	1	32	·002	5	·009	37	·002
Measles	23	86	2	...	111	·005	22	·040	133	·006
Typhus	2	196	270	47	515	·025	680	1·236	1,195	·059
Erysipelas	11	3	9	9	32	·002	1	·002	33	·002
Bronchitis	394	527	336	646	1,093	·094	404	·735	2,307	·114
Lung Diseases..	115	204	361	572	1,252	·062	630	1·141	1,882	·093
Diarrhœa	191	182	46	158	577	·028	9	·016	586	·029
Dysentery	11	38	50	96	195	·009	32	·058	227	·011
Cholera	...	...	3	...	3	...	2	·003	5	...
Diphtheria	5	28	9	7	49	·002	1	·002	50	·002
Croup	21	45	2	...	68	·003	1	·002	69	·003
Puerperal cases	...	...	60	1	61	·003	...	...	61	·003
Chronic affections and Accidents*	1,858	1,304	2,292	3,281	8,735	·434	433	·788	9,168	·454
War cases—										
Combat	...	2	579	23	†604	·030	171	·311	775	·038
Bombardment	...	12	33	27	72	·004	17	·031	89	·004
Totals...	2,797	2,806	4,565	4,938	15,106	·747	2,495	4·532	17,601	·871

* Are detailed in a Monthly Return, which is just now six months *in arrear*. Many were accidents indirectly caused by the bombardment.

† This does not include all the Mobilised National Guard *outside* of the Paris ramparts at sorties, forts, trenches, &c. &c. Like the Army Returns, some were only received during *one week* this month, being sent with them to the War Office, not to the Municipality.

SPECIMEN OF WEEKLY RETURN.

(C.)

MAIRIE DE PARIS.

BULLETIN HEBDOMADAIRE DES DÉCÈS CAUSÉS PAR LES PRINCIPALES MALADIES REGNANTES D'APRÈS LES DÉCLARATIONS A L'ÉTAT CIVIL.

CAUSES DE DECES.	PARIS. POPULATION (1866) 1,825,274h. Du 18 au 24 septemb. 1870.	LONDRES. POPULATION : (1870) 3,214,707h. Du au 187	BRUXELLES. POPULATION : 1er jan. 1870. 176,706h. Du au 187	NEW-YORK. POPULATION : (1869) 1,000,000h. Du au 187	FLORENCE. POPULATION : (31 déc. 1869) 904,001h.	
					Du 28 août au 3 sept. 1870.	Du 4 au 10 sept. 1870.
Variole	158	Les renseignements ne sont pas parvenus.	...	Les renseignements ne sont pas parvenus.	...	...
Scarlatine ...	15		...		...	...
Rougeole ...	6		...		...	...
Fièvre typhoïde	45		...		3	7
Typhus	...		...		...	...
Scorbut	1		...		...	...
Erysipèle ..	3		...		...	...
Bronchite ...	61		...		9	2
Pneumonia ...	62		...			
Diarrhée	43		...		...	...
Dysentérie ...	9		...		...	...
Choléra	...		...		...	...
Angine couenneuse* ...	6		...		...	...
Croup	5		...		...	...
Affections puerpérales...	6		...		...	...
Autres causes ...	852		...		76	78
Total ...	1,272		...		88	87

* Diphtheria.

TABULAR STATEMENT.—Compiled from the Weekly Returns given in at the Mairie de Paris from 18th September, 1870, to 20th January, 1871, inclusive (18 weeks). A specimen of this first form of Weekly Return is attached. It does not contain the distinction of age, or that of army from civil population, as was afterwards the case.

Weekly Returns.	Smallpox.	Scarlatina.	Measles.	Typhoid Fever.	Typhus.	Scurvy.	Erysipelas.	Bronchitis.	Pneumonia.	Diarrhœa.	Dysentery.	Cholera.	Diphtheria.	Croup.	Puerperal Cases.	Other Causes.	Total Number of Deaths.
1870.																	
Sept. 18 to Sept. 24	158	15	6	45	...	1	3	61	62	43	9	...	6	5	6	852	1272
„ 25 Oct. 1	210	4	5	56	...	...	8	36	46	46	33	1	5	8	10	886	1344
Oct. 1 „ 8	212	13	16	54	...	...	56	56	50	69	18	2	2	8	5	972	1483
„ 9 „ 15	311	15	12	51	...	...	11	55	64	72	26	2	9	5	10	964	1610
„ 16 „ 22	360	7	7	55	...	...	10	70	66	76	23	3	5	4	4	1056	1746
„ 23 „ 29	378	9	5	62	...	...	8	77	71	99	49	1	7	5	8	1099	1878
„ 30 Nov. 5	380	6	12	61	...	...	11	72	69	87	32	1	9	6	12	1004	1762
Nov. 6 „ 12	419	7	9	62	...	...	7	82	79	91	39	1	14	5	6	1064	1885
„ 13 „ 19	431	14	9	94	...	...	12	92	73	91	25	2	5	10	8	1198	2064
„ 20 „ 26	386	17	11	103	...	...	17	89	81	92	25	1	9	11	11	1074	1927
„ 27 Dec. 3	412	9	21	140	...	...	9	99	92	76	25	1	6	10	8	1115	2023
Dec. 4 „ 10	311	10	22	137	...	...	7	107	108	83	33	1	8	6	9	1526	2455
„ 11 „ 17	391	11	22	173	...	...	16	100	131	103	38	2	9	12	15	1615	2728
„ 18 „ 24	388	11	19	227	...	...	14	172	147	73	30	3	6	11	6	1627	2728
„ 25 „ 31	454	5	19	250	...	...	10	288	201	98	51	...	13	16	8	1897	3280
1871.																	
Jan. 1 to Jan. 6	329	13	31	251	...	...	9	343	262	151	52	3	19	20	11	2186	3680
„ 7 „ 13	339	11	40	301	...	...	10	457	390	143	46	3	22	20	11	2189	3982
„ 14 „ 20	380	8	44	375	...	...	18	598	426	137	42	...	13	27	15	2382	4465
Totals	6336	185	310	2494	..	1	186	2914	2418	1630	586	27	167	189	163	24706	42312
Percentage* ...	·317	·009	·015	·125	...	...	·009	·146	·121	·815	·029	·001	·008	·009	·008	1·235	2·115

* On Estimated Population of 2,000,000.