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"Je prends le bien ou je le trouve."

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1861.
A disease produced by so many various causes; affecting the various ages and constitutions so differently; involving in its course such various portions of the lower part of the canal, being sometimes simple rectitis, and then involving the whole colon, and even the ileum; frequently complicated with disturbance of the liver and febrile reaction, makes the suggestion to treat the "case and not the malady" a common sense precept.

The idea which I wish to impress will be best illustrated by noticing, in their order, the classes of cases which were produced by their several causes.

**Dysentery from Improper Dieting.**—Case 1.—Mr. C., aged 60, of good character and constitution; large, tall, well formed, a man of indomitable energy, but very irregular in his habits of eating. Would rise before day and ride till dinner, when, tired and hungry, would sometimes indulge too freely. I was called in great haste to see him, September 11, 1845. Found him with intolerable pain in the umbilical region, coming on in paroxysms, followed by tenesmus and passing only spoonfuls of mucus, and then having to throw up. I learned that he had been riding all the morning, since before day, looking after his stock, and that,
on his return, he took a very hearty dinner, which was the first thing he had ate that day. Prescribed at once 10 grs. calomel and followed in short time with three drops croton oil, hot bath, counter irritants to the abdomen, but without benefit. Sent home and got a long gum elastic stomach tube, which I introduced far up into the colon and threw about a quart of warm water. He said he felt the water reach the part which seemed to be obstructed. Copious discharges of hardened feces immediately followed, and was soon well.

Case 2.—During the hog-killing season of the same year, when we of the country are so prone to indulge in "swines' flesh and broth of abominable things," a gentleman, after being cold and fatigued all day, partook too freely at night of the rich fruits of his day's labor, and was tormented for two days by paroxysmal pains throughout the abdomen, harassing tenesmus, great difficulty in urinating and frequently passing small quantities of bloody mucus. Would take scarcely any medicine or submit to the use of the syringe, saying he would certainly soon be relieved, for he felt as if he would pass the disturbing matter very soon. Was finally relieved by the hot hip bath, which brought away large, hardened matters in abundance, followed by the contents of that unfortunate supper.

Dysentery from Cold and Fever.—Case 3.—May 2nd, 1860, called to see J. W. H. B., Esq., aged about 30, of good habits, medium size, well formed, dark complexion and black hair; constitution only tolerably good. His mother died of chronic bronchitis, and he was very prone to be affected by sudden changes of weather with cold and cough of so serious a character as to keep him apprehensive of evil. Also, subject to most distressing attacks of dyspepsia. Mr. B. had recently taken cold which, instead of affecting the lungs as cold usually does in his case, caused large, frequent, serous discharges from the bowels, which very soon became painful, straining, small, consisting of mucus and blood, and attended with intermittent fever. Prescribed oil
and turpentine emulsion, as used by Dr. Robert Campbell,
every four hours, and 18 grs. quinine to intercept the next
paroxysm of fever.

May 3rd, Mr. B. had fever again. The condition of the
bowels was, if anything, worse. The oil mixture seemed to
have aggravated the griping pains, and the tenesmus was
intolerable. Dyspeptic symptoms also being urgent;
patient was disponding. Gave an occasional dose subnitrate
bismuth, continued the oil mixture in less doses, and
quinine as before. Bathed the bowels with essence peppermint
and covered them with a folded blanket which caused
considerable burning and much relief.

May 4th.—Discharged the same bloody, straining, mucus
character. Considerable fever. The oil emulsion, our
favorite remedy, had to be abandoned in this case. Substituted:

Mucilage gum arabic, 3 oz.
Cream of tartar, 1 oz.
Pure sugar, ½ oz.
Oil lavender, 4 gtt.

(I have used the spirits of lavender, but think oil best for
this mixture,) a tablespoonful every three hours. Quinine
as before.

May 5th.—Patient sitting up, reading—convalescing.
I had two other cases at the same time, produced by the
same change of weather; so similar in character, treatment
and results I need not detail them.

The oil treatment in these cases was not successful from
the fact that they commenced with diarrhoea, which cleared
out the upper portion of the canal, and left the mucous mem-
brane so sensitive that the oil excited it to action. In cases
where dysentery has supervened a diarrhoea, cream of
tartar, in small doses, has acted, in my practice, like a charm
by making a slight renewed impression on the serous mem-
brane, which relieves the mucous surface by a revulsive ac-
tion. And it is evidently better than salts for that purpose,
because less irritating. To the next case the oil treatment was well adapted.

Case 4.—February, 1860, Rev. Mr. W., aged 20 years, a young gentleman of unexceptionable character and habits. Tall, slender form, red complexion and sandy hair. By constant travelling and exposure to cold and inclement weather, had taken cold, bowels constipated, and had irregular paroxysms of fever every forenoon, attended with griping pains in the bowels and frequent small discharges of bloody mucus. Prescribed 16 grs. quinine early in the morning, and a tablespoonful of the oil mixture every four hours. Bathed the abdomen with essence peppermint and covered it with folded blanket, which afforded him so much comfort that he pronounced it the only thing that saved him.

The next day the fever had returned and aggravated the dysenteric symptoms. Continued the same treatment. Third day the disease had so abated I left him and he was soon well.

_Dysentery, the sequel of Measles._—Case 5.—May 28, 1853. A negro woman, aged 30 years, black, well formed and good constitution, belonged to Mr. II. Was suffering great pain low down in the abdomen, paroxysmal, attended with bloody, watery, mucus discharges and painful tenesmus. The womb was excited to action by the inflammation and continued spasmodic action of the colon and rectum, and fever of a remittent type aggravated all the symptoms. She had measles a month before in which the fever was very high. Nature had, as usual in such cases, abated the fever by a diarrhoea, which terminated in dysentery. That was thought but little of, and allowed to run until it became alarming. Attempts were then made by the family to cure the case with opiates and sundry astringent herbs, and then by large and repeated doses of calomel which brought her to the helpless state of prostration in which I found her. So soon as the fever had abated a little, I covered the abdomen with a blister to be dressed with a hot poultice, and
put her on 3 grs. quinine and 1 gr. opium every three hours to intercept the next rise of fever and to quiet the action of the uterus.

May 29.—Had less fever and pain, but dysentery still persisted. Prescribed quinine dissolved with elixir vitriol in 2 gr. doses every four hours, toast water, chicken water, etc., under which she improved till the 2nd day of June, four days from the time I first saw her, she had so far recovered I left her.

Case 6.—June 12, 1856.—A youth, son of Mr. H., of same family, as the above, aged about 15, that tender age of boys, had measles, and dysentery as its sequel at the same time, was not thought to be so dangerous as to require my services while I was attending the negro, but was treated by the family with repeated doses of calomel and astringents and opiates.

I found him completely prostrate. Tormina in paroxysms, and most distressing tenesmus; passing every few minutes small quantities of watery, bloody mucus. Fever had been intermittent but was now almost continued. The treatment after I saw him consisted mainly of quinine dissolved with elixir vitriol and an occasional dose of opium which the severe pain seemed positively to demand. And copavia and gum water.

Cases 7 and 8.—Aged about 10 and 12, were younger brothers of the above, who were taken while I was attending case 6, and a milder treatment adopted from the first, they soon recovered.

Dysentery from Drunkenness.—Case 9.—November 1, 1853. Called to see Dr. M., a young professional brother, aged about 25 years, who was universally respected for high toned honor and gentlemanly bearing. Had graduated only three years previously in the Medical College of Georgia. Was pronounced by Dr. E. L. Anthony, his preceptor, to have had the best physical constitution he ever saw. But in an evil hour, while reading medicine in Waynesboro, he glided gradually and imperceptibly into
the habit of visiting the bar rooms, which so completely undermined his moral sensibilities that he did not more than complete his education and get fairly into practice, where an honorable and useful career awaited him when he found his moral and physical energies paralized and he fell back in hopeless despair. I found my young friend in bed, emaciated, bloated face, and a countenance which indicated the most dreadful horror. Very cautious in retrospecting the history of his case. Had to get my information respecting his past course from others. It made me sad. For three years he had been in the constant habit of sending for a gallon of spirits at a time, with the intention of taking only a little as he needed it. That was, of course, when fatigued and exposed to cold and wet on his visits at night, &c. But instead of using it necessarily as he honestly intended, he drank each new supply sooner than the former. And being a man of means and social, liberal, friendly feelings, he was not alone long at a time and his comrades were not angels by any means.

I found him with a supply of wine, and about the only information I could get directly from himself was that brandy made him sick and could not be retained, that wine was retained better than spirits and that it was impossible for him to do without something of the sort. It just then recurred to my mind that only a short time before that I was passing his house late at night and saw him leaning over the piazza rail heaving as though he was trying to eject the whole abdominal vicera from his mouth. At the same time had all the symptoms of the most distressing and threatening dysentery. And so debilitated was he that it was impossible for him to get down to the chamber on the floor, and had a box fixed on a level with the bedstead that he might glide off easily over the chamber. Once while sitting on his box his hands were moving the soft flabby muscles (once so plump and hard,) and while folding and doubling them, and pressing with his fingers as if to feel how near it was to the bone, he sighed and said, spirits
has done all this! and it was remarked by those who had been with him constantly that that was the first time he had ever admitted that spirits was doing him any harm.

Now, it was evident that the whole canal was involved. The stomach could retain only a spoonful of anything at all and nothing stronger than wine; the duodenum and small intestines were painful and distended; the colon and rectum inflamed, and constantly discharging blood and water and mucus and some pus, which was wasting him away. The nutritive functions were so completely destroyed he must have perished even though he could have eaten.

The thought of treating such a case farther than to soothe for a few days would be absurd. Dr. E. L. Anthony, who kindly came to my assistance, suggested salts as recommended by Drs. O'Keeffe and Dugas, but it only added to the sensitiveness of the whole canal and rendered him still more nervous. Nothing could be done but soothe with wine and opiates so long as the system was susceptible.

Case 10.—Called June 4, 1854, to see Mr. Q., an Irishman, farmer, about 35 years of age. An honest, energetic, thrifty man of good constitution. Had recently great trouble with his negroes, and went to Augusta to sell one, where by drinking, exposure and improper dieting he had a fit, of cholera morbus. A physician gave him a dose of laudanum and sugar of lead, which enabled him to get home. I found him next day with considerable fever, stomach very irritable, and passing from the bowels every 20 to 30 minutes, bloody, watery mucus, attended with griping pains and tenesmus; bowels sore and distended, restless and very apprehensive of a fatal result.

Prescribed small doses cream of tartar every three hours and 3 gr. doses quinine, with $\frac{1}{2}$ gr. doses opium between the times of giving the cream of tartar.

June 5.—The cream of tartar had reduced the distension of the bowels some, but the fever, discharges and tenesmus about as yesterday.

June 6.—All the worst symptoms somewhat abated and
we were somewhat encouraged. Continued the same treatment.

June 7.—Discharges larger and less bloody, but fever persisted. Dismissed the cream of tartar and continued the quinine.

June 8.—Fever high, discharges frequent, painful and straining. Continued the quinine with occasional doses of opium.

June 9.—All the symptoms remaining the same and the bowels being more distended, a blister was applied all over the abdomen.

June 10.—Fever had abated some and the passages less frequent and the pain had diminished very much, but now the parotid glands had swollen enormously. Dr. E. L. Anthony was called in consultation. Patient was put immediately on Dr. A.'s favorite remedy, sulph. magnesia, and quinine as before, and painted the parotids with tinct. iodine.

June 11.—The salts had caused enormous serous discharges, but the patient was so prostrate it had to be abandoned. Continued the quinine dissolved in the aromatic sulphuric acid and an occasional dose of opium.

June 12.—Growing worse in all respects. Blister had relieved the distension but slightly, and was itself exceedingly troublesome and painful. The passages, frequent, painful, bloody, watery, mixed with pus, and exceedingly offensive. (If it be said he drank "rot gut whiskey," I reply, all spirits rot the guts if we are to judge by the character of the discharges in the last stages of drunkenness.) He was restless and unable to get out of bed. Kept him on quinine in 2 gr. doses, elixirvitriol and opiates, &c., under the use of which he lingered until the 29th, 24 days after his return home.

Dysentery from Teething.—Case 11.—April 25, 1860.—Called to a little negro boy two years old, property of Hon. J. A. S. Several teeth coming in a group, gums swollen, had had diarrhœa for several days, passing large quantities
of watery matters, sometimes white, undigested bread, &c., passed directly through him, at other times greenish. This was followed by bloody mucus in small quantities with pain and tenesmus, complicated with remittent fever, and that symptom so much dreaded in such cases—hot head—was also very prominent. Prescribed the oil and turpentine emulsion in small doses every four hours, a liniment of olive oil, tinct. iodine and camphor for bathing the abdomen, cold water to the head and quinine in 1 gr. doses every 3 hours.

April 26.—Patient had more copious discharges and less blood and tenesmus, but did not urinate freely. Continued the same treatment with the addition of buchu tea.

April 27.—Head less hot, dysentery persisting. The same treatment was kept up with very little variation till the 1st of May, four days longer without, any permanent change for the better. The abdomen being distended, applied a blister.

May 2.—The benefit resulting from the blister had been only temporary, all the symptoms were worse. Continued the oil emulsion, increased the doses of quinine and added small doses ipecac.

May 3.—Dysenteric symptoms persisting, little negro beginning to look quite ghastly. Made him an emulsion of

Gum arabic, 2 oz.
Loaf sugar, ¼ oz.
Copavia, ½ dr.
Oil lavender, 3 gtt.

One teaspoonful every 3 hours; quinine and ipecac as before.

May 4.—Much better every way. Continued the same.

May 5.—Patient convalessing—left it. It bloated and got up slowly, but surely.

N. B.—This case commenced with diarrhoea, similar in some respects to Case 3.

Case 12.—S. S., aged about 20 months, a fine sprightly
boy, son of Mr. F., of Savannah, was unfortunately weaned while a group of teeth were just causing the gums to look red and swollen. Diarrhœa set in in April, 1860, and was checked with chalk and opiates. Dysentery soon followed of so violent a character that Dr. Young, the family physician, advised its removal to the country as the only chance for its life. It did not come to this place till June, two months after; when I found it with fever, coming on late in the afternoon and lasting all night, with hot head, continual moaning, jumping, trying to get out of bed, screaming frequently, as if frightened, and passing from half dozen to ten bloody, mucus, greenish discharges during the night and several during the day. The abdomen was much distended. Appetite sometimes entirely absent, at others voracious. The oil emulsion acted finely at first. Lessened the frequency and improved the character of the discharges. But the dysenteric symptoms would soon return. Lanced the gums frequently and covered the surface of the body with olive oil morning and night. The teeth which we thought would be through in a few days remained at a stand, and all the symptoms would return suddenly and blight our hopes. I found the cream of tartar emulsion as used in the 11th Case the best means of reducing and softening the distended bowels. Towards the last of June he was so emaciated, his joints appeared so very large, limbs and neck so small, had entirely quit walking and the head would hang on the shoulders, and the tired, distressed countenance made his look almost frightful. The discharges also had that rotten flesh fetor, which led me to suspicion rachitis.

By the first of July the dysenteric symptoms gave way. But the discharges continued frequent, watery and offensive. And what to me was singular, a tumor appeared under the tongue, which I at first took to be ranula. Prescribed solution

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<th>Gum arabic, 2 oz.</th>
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<td>Copavia, $\frac{1}{2}$ drachm.</td>
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Give a teaspoonful every 4 hours, and cod liver oil twice every day, which had a most happy effect, lessened the frequency and offensiveness of the discharges, and made them more consistent. But the tumor under the tongue continued for some weeks, when he was found to be salivated and the tumor had disappeared. The same mixture, except the iodide, was continued several weeks longer. The salivation subsided and the tumor returned. Iodide potash was again combined with the mixture, salivation soon appeared and the tumor again subsided. But still the general improvement was unsatisfactory. Sometimes feverish discharges, too frequent, watery and now and then offensive, but little improvement in appearance. About the first of August commenced the inunction with olive oil again over the entire surface every night; applied a flannel roller to the whole body and dusted it well with red bark. That was continued through August and September, and the above mixture, minus the iodide, every four or five hours. Last of Sept., four months from the time he came under my care he was found to be growing plump, lively and stronger, and returned home in high hopes. His mother writes, November 1st, little S. S. is still fattening.

I have treated dysentery during the last spring a great deal on the general principles above indicated, with the most happy results with one single exception.


Of this affection the following characteristics are summed up:

1. Dull pain in the lumbar region, increased on long standing and diminished by lying down; in some people neuralgia often affecting the intercostal nerves; occasional loss of sensibility of the skin down the spine.

2. In the early stages, slight incurvation of the spine; in the later ones this is so great that the head rests on the breast.

3. Excavation of the vertebral gutters, so that the verte-
bral extremities of the ribs may be more or less easily distin-
guished.

4. Some painful point exists on a level with a lumbar spinous apophysis, owing probably to stretching of the ligaments which have lost tonicity.

5. In advanced cases a peculiar elasticity at the level of the spinous and transverse apophyses of the vertebrae, due to tension of the aponeurosis.

6. Impossibility in maintaining the erect posture without support.

7. Incomplete power of extending the trunk without fixation of the upper limbs.

8. Alteration in the natural curvatures of the spine, the concavity of the cervical region being the first to disappear.

9. Right declination of the whole spinal column to the right side.

10. Incomplete straightening of the spinal column by Farardization of the muscles of the vertebral gutters.

11. Freedom of movement of the cervical muscles, excepting the above-mentioned incurvation.

12. Increased mobility of the vertebrae one upon the other, owing to the relaxation of the muscles, attended by occasional noise like the crepitus of certain dislocations.


M. Dolbeau, in temporary charge of M. Guersaut’s wards at the Children’s Hospital, has taken the occasion of the presence of two cases to make some interesting observations upon the operations best suited for the relief of stone in the child. One of these patients, four years of age, had been submitted to bilateral lithotomy by M. Guersaut, and did very well, except that a month after the operation, a fistula remained, which will require surgical interference. The other child, seven years old, had a very hard calculus, measuring three centimetres in one direction by two and a half in another. M. Dolbeau liberated him of this by means of lithotrity, eleven seances, each of about a quarter of an hour’s duration being required between the 11th July and the 20th of August. Chloroform was employed, and but very
little local irritation was produced. The bladder, possessing but little power, discharged the fragments very imperfectly, and considerable difficulty was often experienced in their removal.

In estimating the comparative value of the two operations for children, in 1849 M. Guersaut gave the decided preference to lithotomy, except in those cases in which the stone admitted of being crushed in a single seance; but, although this surgeon has published no statement since that time, M. Dolbeau now states that he performs lithotripsy much more frequently than he did, by no means limiting its application to cases which can be disposed of in a single seance, and that his success is far more considerable than heretofore. Several of the circumstances which have been objected to lithotomy are really due to the want of skill on the part of the surgeon. A serious inconvenience, however, is the engagement of the fragments in the urethra—a complication far more common in children than in the adult. In place of moderating the efforts at micturition, performing them in the horizontal posture, and using various other precautions, they expel all the fragments through the dilatable neck of the bladder into the urethra. Other inconveniences of urine, and sometimes a very notable diminution in the contractile power of the bladder, are in general of no long duration.

In M. Dolbeau's opinion, the two operations may be thus compared: lithotomy is applicable in all cases. It very frequently succeeds, but it exposes to accidents, such as inflammation and the establishment of fistula, which are difficult of cure. As a general rule, the operation is simple and easy of execution. Lithotomy is not applicable to all patients, but in determinate cases its results are excellent. Its execution necessitates a special dexterity, as it presents greater difficulties than does lithotomy. It may also give rise to accidents, as urethral fever, which may carry the patient off, the engagement of fragments in the urethra (a very serious complication), and incontinence or retention of urine. As the operation of lithotomy may have to be extended over a long period (a child nine years of age, a patient of M. Civiale, required seventy seances), the health should be good, and the bladder healthy and of good capacity. Nor must the calculus be too large or too hard; its volume may be considerable if it is only friable, but in the case of a large stone, three centimetres is an extreme size. In spite of the success of lithotomy, it is an operation that should not be performed except when lithotripsy is inapplicable. A seance of lithotripsy may always be first
Fracture of the Scrumum. [July,

tried in doubtful cases, in order to judge whether this can be borne, and that without any prejudice to the ultimate success of lithotomy. Chloroform should always be had recourse to, its advantages far outbalancing any inconvenience which may result from its use. As none but small instruments will enter an uretha of the amount of development in a child, the habit of manipulating with such must be acquired. The seizure of the stone is a matter of difficulty, and that not so much from the want of capacity in the bladder as from its form and situation. In place of being comprised within the pelvis, it occupies a part of the abdomen, while the absence of the prostrate prevents the formation of the depressed part termed the basfond, where in the adult the stone is so frequently found. The bladder is large, since it mounts up into the abdomen, and the very moveable stone has no fixed situation. In the author's opinion, the manipulation is facilitated by leaving only a little fluid in the bladder, and by raising the buttocks so as to keep the buttocks so as to keep the stone in the most dependent part of the bladder. When the stone is hard and large, owing to smallness in size of the instrument, it is held and broken up with difficulty. When the stone has been broken up, it is the engagement in the deep portion of the uretha to be most feared. We must especially endeavor to reduce the smaller fragments to powder, or they may sometimes be gently removed in the grasp of the instrument. Fever seldom follows either catheterism or lithotritry operations in the young, and in consequence of the little reaction which takes place, the seances may be longer or sooner repeated (every two or three days at most) than in the adult.—Moniteur des Hopitaux.

Cases of Fracture of the Scrumum. By MM. Hamon and Mercer.

As this accident is of such rare occurrence, and is so concisely treated of by writers on surgery, M. Hamon supplies the details of a case which occurred in his practice.

A woman, aged twenty-eight, July, 1856, fell upon her seat from a height of about ten feet. On examination, the lower part of the scrumum, at nine centimetres above the point of the coccyx, was found flattened and carried forwards, free movement being imparted to the fractured portion, with-
out any pain being induced when the finger was passed into the rectum. The bladder and rectum were paralyzed, both requiring aid for the removal of their contents. While nothing remarkable was observed with regard to the thighs, the legs were paralyzed. Seen two years afterwards; the rectum had recovered its power, but the catheter still had frequently to be used, while the paralysis was so far amended as to admit of the patient walking, although with difficulty and with the aid of crutches. M. Hamon saw the patient last early in the past year, and nearly four years after the accident. He found that menstruation, defaecation, and the discharge of urine, all took place in a normal manner. A very projecting angle could be felt at the seat of fracture. While the thighs were of their normal size, the muscles of the legs had undergone considerable atrophy. The motors of the legs were only enfeebled; and although all movements of the foot were found to be impossible when it was held free in space, these became executible as soon as the heel rested on the ground. All the motors of the toes were completely paralyzed. Imperfect perambulation by means of a crutch and stick was alone possible.

In reporting upon this case, which was read at the Paris Medico-Practical Society, M. Mercer relates another example of the accident, which occurred during his internat at the Hotel Dieu: A young mason fell from a height on to a stone in the sitting posture, and a compound fracture of the sacrum was the result; the fracture extending obliquely from one side to the other, at three inches above the point of the coccyx, and the detached portion being carried to the right. The rectum, seen at the bottom of the wound, remained intact. The skin covering the middle portion of the posterior surface of the pelvis had lost its sensibility to the extent of three or four inches transversely. Beyond this the sensibility was preserved, and the lower limbs were not paralyzed. The expulsion of neither urine nor faeces took place without aid, but after some days loose stools were discharged involuntarily. The patient sank exhausted twelve days after the accident. Large portions of the sacrum were found inseparable, and bathed in pus. The cauda equina was destroyed, the inflammation and suppuration invading the portion occupying the lumbar spine as high as the third vertebra. All the roots of the sacral plexus, excepting the last lumbar and first sacral pair, were destroyed.

M. Mercer concludes from these two cases, that the paraplegia is much less the effect of the rupture of the nervous cords compromised by the fracture, than of the consecutive
compression and inflammation of the nervous plexus of the pelvis; and he suspects that the prevalence of the paraplegia in the slighter case, and its absence in the severer one (although in this last any difference which might prevail between the condition of the thighs and the legs was not sought for), may depend upon the effused blood not obtaining the outward issue in the one case which it did in the other.

M. Mercer further draws attention to this question. Why, in any case of paraplegia coming on rapidly, does the paralysis of the rectum, and especially that of the bladder, habitually commence with the retention of the contents, incontinence manifesting itself only at a more or less distant period? So complete is this retention in some cases of lesion of the spinal marrow, that the bladder would burst rather than allow a few drops of urine to escape. Supposing there to exist an equal inertia of the body and the sphincter of the organ, the slightest repletion ought to lead to a continuous discharge; and admitting, what seems to be the fact, that the sphincter is more under the influence of the spinal cord than the body of the reservoir, it ought to be the first effected by such lesions, and incontinence should at once appear; while it is just the contrary which is observed to take place. The neck of the bladder, in fact, is not closed by a simple wrinkling, as is generally supposed. The muscle, acting as the occluding agent, gives rise to a true valve, which the tonicity of this muscle is enabled to keep closed until the distension of the organ and the passage of instruments at last have destroyed the last remains of the contractility of tissue. Then, not only is there regurgitation of urine, but a true incontinence. M. Mercer has expressed his views at length in the Gazette Medicale for 1854. The remarks made on the tonicity of the sphincter of the bladder may be applied to the anal sphincter. And, although the functional mechanism of the latter is not so favorably disposed; this is the less necessary, in consequence of its strength, and the compact nature of the matters it has to retain.—L'Union Medicale.

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Ox-Gall in Frost-Bite.

Assistant Surgeon Moore, of the United States Army in Utah, states that he has employed fresh ox-gall in frost-bite with great benefit, when the injury is superficial. It is applied as a liniment or on pieces of lint saturated with it.—American Med. Times.
CHAPTER 1.

HISTORICAL SKETCH OF MILITARY SURGERY.

The duties and requirements of military are essentially similar to those of civil surgery. It is founded upon the same knowledge of anatomy, medicine, and the associate sciences; it demands the same qualifications, physical, moral, and intellectual. The difference consists in the application of our knowledge rather than in its range or depth. The civil surgeon remains at home; the military follows the army, examines recruits for the public service, and superintends the health of the troops. If the former is well educated, he will be quite as competent, at any time, as the latter to perform these duties; for the emergencies of civil are often not less trying than those of military practice, although they may not be on so large a scale.

The best civil have often also been the best military surgeons. In proof of this assertion it is necessary only to refer to the names of Pare, Wiseman, Schmucker, Kern, Larrey, Guthrie, Charles Bell, Alcock, Thomson, Ballingall, and Macleod, of Europe; or to those of Rush, Jones, Ichabod Mann, and Horner of our own country.

Military surgery occupies, at the present day, a deservedly high rank in the estimation both of the profession and of the public. The war in the Crimea, the mutiny in India, and the recent convulsions in Italy, all attended with so much waste of blood and life, have attracted to it the universal attention of the profession; and the revolutionary movements now in progress in our own country invest it with a new and fearful interest to every American physician. Its praises have been sung by Homer, and, in all ages of the world, governments have extended to it a fostering hand. As a distinct branch, however, of the healing art, it dates back no further than the early part of the sixteenth century, when it was inaugurated by Ambrose Pare, by the publication of his treatise on "Gunshot
Wounds," the fruits of his observations in the French army in Italy. This man, who was surgeon to four successive kings, was an eye-witness of the numerous French campaigns, from 1556, down to the battle of Moncontour, in 1569, a period of thirty-three years. His popularity, both as a civil and military surgeon, was, up to that time, without a parallel. The soldiers worshiped him; and the success of more than one siege, as well as of one battle, was due almost exclusively to the wonderful influence of his presence. His treatise on "Gunshot Wounds" appeared towards the middle of the sixteenth century, and, after having passed through various editions, was ultimately incorporated in his surgical writings, published nearly a quarter of a century later.

In England, the earliest work on military surgery was that of Thomas Gale, entitled a "Treatise on Gunshot Wounds," designed chiefly to confute the errors of some of his contemporaries, respecting the supposed poisonous nature of these lesions. Gale was born in 1507, and after having served in the army of King Henry VIII., at Montricyle, and also in that of King Philip, at St. Quintin, finally settled at London, where he acquired great distinction in his profession. In 1639 appeared the work of J. Woodall, "The Surgeon's Mate; or, Military and Domestic Surgery." He was surgeon under Queen Elizabeth, by whom he was sent to France, along with the troops that were dispatched to the assistance of Henry IV. and Lord Willoughby. In 1676, Richard Wiseman, sergeant-surgeon to King Charles II., published his famous "Chirurgical Treatises," one of which was expressly devoted to the consideration of gunshot wounds. Two years after this a treatise on gunshot wounds was published at London, by John Brown, also surgeon to Charles. He was a man of eminence, and served with much credit in the Dutch war of 1665. The next English work on military surgery appeared in 1744, from the pen of John Ranby, sergeant-surgeon to George II., under the title of "The Method of Treating Gunshot Wounds." After Ranby came the imperishable work of John Hunter, familiar to every reader of English surgical literature. The part relating to gunshot wounds was founded upon his observations made while serving as staff-surgeon at Belleisle and in Portugal, and is one of the most precious legacies of the last century, near the close of which it appeared.
The present century has supplied quite a number of works on military surgery, as is shown by the valuable publications of Larrey, Hennen, Hecker, Augustin, Guthrie, Thomson, Hutchinson, Ballingall, Baudens, and others, which have contributed so much to the elevation of this department of the healing art. Some of these works have been re-issued in this country, and have acquired a wide celebrity.

We must not forget, in this rapid enumeration of works on military surgery, the "Manuel de Chirurgien d'Armee" of Baron Percy, published at the commencement of the revolutionary war in France. It is a model of what such a treatise ought to be.

The only work on this department of science yet furnished in this country, is that of the late Dr. James Mann, published at Dedham, Massachusetts, in 1816. It is entitled "Medical Sketches of the Campaigns of 1812, '13, and '14," and forms a closely-printed volume of upwards of three hundred octavo pages.

The latest treatise on this subject in the English language is that of Dr. George H. B. Macleod, now Professor of Surgery at Glasgow, entitled "Notes on the Surgery of the War in the Crimea; with remarks on the Treatment of Gunshot Wounds." It is a work of intense interest, written with great ability by an accurate and diligent observer, and is worthy of a place in every medical library. To this work frequent reference will be made in the following pages.

To Dr. Lewis Stromeyer, Physician of the Royal Hanoverian Army, we are indebted for the most recent German work on military surgery. It was issued in 1858, under the title of "Maximen der Kriegsheilkunst," in two duodecimo volumes, to which a Supplement was added in the early part of the present year. A more valuable contribution to this department of surgery could hardly be imagined.

Besides the above more recent works, the reader should carefully study the "Principles of Military Surgery," by the late Dr. John Hennen, one of the most zealous and distinguished military surgeons that Great Britain has yet produced; a man of vast experience and of the most enlightened views upon everything he has touched with his pen.

Perhaps the most systematic work on the subject in the English language is that of Sir George Ballingall, entitled
"Outlines of Military Surgery," the last edition of which, the fourth, appeared only recently at Edinburgh, where the author held for many years the chair of military surgery, for a long time, we believe, the only one in Great Britain. It is a production of much merit, and is destined to maintain a very high rank in this species of literature.

The works of the late Mr. George Guthrie also deserve attentive study; they are written with great clearness and ability, and embody the results of an immense experience, acquired during many years of arduous and faithful labor and observation in the British army. I have always regarded the works of this great man as among the most valuable contributions, not only to military surgery, but to surgery in general, in the English language.

With these works before him, the student of military surgery cannot fail to make himself in a short time perfectly familiar with everything pertaining to the subjects of which they treat. He should also provide himself with a copy of the excellent little volume entitled "Hints on the Medical Examination of Recruits for the Army," by the late Dr. Thomas Henderson, formerly Professor of Medicine in Columbia College, Washington City. A new edition of it was published a few years ago by Dr. Richard H. Coolidge, of the United States army.

Although we have long had one of the most respectable and thoroughly organized army and navy medical staffs in the world, our country has, nevertheless, not produced one great military surgeon; simply, it may be presumed, because no opportunity has occurred since the establishment of our government in which the men in the public service could distinguish themselves. Their aid has been required in the duello and in skirmishes rather than in great battles, such as have so often characterized the movements of the armies of the Old World. We make no exception in this remark in favor even of the battles that were fought during the Revolution, and during our Late War, as it has usually been designated, with Great Britain. Those engagements were, for the most part, comparatively bloodless. Happily living under a flag which, until recently, commanded alike the respect and the admiration of all nations, belonging to a government which was at peace with all foreign powers, the medical and surgical staffs of the public service had little else to do than to prescribe for such diseases as are incident to civil practice. America has never witnessed,
and we trust in God she never may witness, such carnage as that which attended the footsteps of Napoleon at the bridge of Lodi, at Leipzig, at Dresden, and at Waterloo; or which, more recently, characterized the exploits of the English, French, and Russian forces in the Crimea; or of the French, Italian, and Austrian armies in Italy; or of the English soldiers during the late rebellion in India. Nor has she ever been engaged in one great naval battle similar to that of La Hogue, Toulon, Trafalgar, or Aboukir. A number of highly respectable physicians accompanied our army to Mexico, but they returned without any special laurels, and without any substantial contributions to military medicine and surgery.

CHAPTER II.

IMPORTANCE OF MILITARY SURGERY.

It is impossible for any civilized nation to place too high an estimate upon this branch of the public service. Without the aid of a properly organized medical staff, no army, however well disciplined, could successfully carry on any war, even when it is one, as that which is now impending over us, of a civil character. No men of any sober reflection would enlist in the service of their country, if they were not positively certain that competent physicians and surgeons would accompany them in their marches and on the field of battle, ready to attend to their diseases and accidents. Hence military surgery, or, more correctly speaking, military medicine and surgery, has always occupied a deservedly high rank in public estimation.

Dionis, a surgeon far in advance of his age, in referring to the value of medical services to soldiers, exclaims, with a burst of eloquence: "We must then allow the necessity of chirurgery, which daily raises many persons from the brink of the grave. How many men has it cured in the army? How many great commanders would have died of their ghastly wounds without its assistance! Chirurgery triumphs in armies and in sieges. 'Tis true that its empire is owned: 'tis there that its effects, and not words, express its eulogium."

The confidence reposed by soldiers in the skill and humanity of their surgeon has often been of signal service in
supporting them, when exhausted by hunger and fatigue, in their struggles to repel the advancing foe, or in successfully maintaining a siege when the prospect of speedy surrender was at hand. Who that is versed in the history of our art does not remember with what enthusiasm and resolve Ambrose Pare, the father of French surgery, inspired the souls of the half-starved and desponding garrison at Metz, in 1552, when besieged by 100,000 men under the personal command of Charles V.? Sent thither by his sovereign, he was introduced into the city during the night by an Italian captain; and the next morning, when he showed himself upon the breach, he was received with shouts of welcome. "We shall not die," the soldiers, exclaimed, "even though wounded; Pare is among us." The defense from this time was conducted with renewed vigor, and the French army ultimately completely triumphed, through the sole influence of this illustrious surgeon.

No man in the French army under Napoleon rendered so many and such important services to the French nation as Larrey, the illustrious surgeon who accompanied that mighty warrior in his various campaigns, everywhere animating the troops and doing all in his power to save them from the destructive effects of disease and injury. His humanity and tenderness was sublime; and so highly was his conduct, as an honest, brave, and skillful surgeon, appreciated by Napoleon, that he bequeathed him a large sum, with the remark that "Larrey was the most virtuous man he had ever known."

CHAPTER III.

QUALIFICATIONS AND DUTIES OF MILITARY SURGEONS.

It is of paramount importance that none but men of the best talent and of the highest education should be received into the public service. Rigid as the examination of the army and navy medical boards already are, there is need of increased rigor, in order that none may be admitted who are not thoroughly prepared for the discharge of their responsible duties. Equal vigilance should be exercised in regard to the introduction of physicians and surgeons into the volunteer service. Every regiment should be provided with an able medical head, a man ready for every emer-
gency, however trying or unexpected; a man skilled in the
diagnosis and treatment of diseases, and competent to per-
form any operation, whether small or large, on the spur of
the moment. To do this, he must be more than a mere
physician; he must be both a physician and surgeon, in the
true sense of the terms, otherwise he will be unfit, totally
unfit, for his position. He must have been educated in the
modern schools; be of undoubted courage, prompt to act,
willing to assume responsibility, humane and sympathizing,
urbane and courteous in his manners; in short, a medical
gentleman, as well as a medical philosopher, not hesitating,
if need be, to perform the most menial services, and to do
all he can to preserve the health and the lives of the sol-
diers committed to his care. The white-gloved gentry,
such as figured in some of the regiments that went to
Mexico, have no business in the service; their time can be
much better spent in the discharge of their domestic duties,
in the practice of their neighborhood, and in the contem-
plation, at a distance, of the miseries of war.

It is much to be feared that, from the rapid manner in
which our volunteers have been hurried together, many
medical men, old as well as young, have already been ad-
mitted into the service utterly unfit for the office. If this
be the case, let our authorities, warned by the past, be
more circumspect in regard to the future. Above all, let
them see that the medical staffs of the brave volunteers of
the country be not defiled by charlatans and unworthy men,
between whom and the regular practitioners there cannot
possibly be any professional, much less social intercourse,
either in civil or military practice. The medical men
should be on the best possible terms with each other; all
causes of discord and bickering among themselves should
be studiously obviated, and speedily suppressed, if, unfor-
unately, they should arise. Concert of action on the part
of the medical corps is indispensable to the success of the
medical operations of an army.

Every regimental surgeon should have at least two assis-
tants in time of peace, or during the inactivity of the troops
under his charge; when on active duty, on the contrary,
the number should at least be double, especially in the face
of an anticipated bloody engagement. These assistants
should be selected solely with reference to their compe-
tency; they should, like the principal, be eminently intel-
ligent, and ready, in case of emergency, to perform any
operative that occasion may demand. Every brigade should have its brigade surgeon, who should exercise a supervisory control over the regimental surgeons, principals as well as assistants, as every State should have its surgeon-general, or medical-director, whose duty it should be to superintend the whole medical arrangements, seeing that the candidates for the medical department of the service be subjected to a rigid examination, attending to the purchase of medicines and instruments, providing suitable nurses, inspecting the quarters, stores, and provisions, that nothing of an unwholesome character may find its way into the ranks, pointing out the proper location of camps, and the construction of hospitals, and giving general instructions in regard to military hygiene, or the best means of avoiding disease and accident.

Prior to every engagement at all likely to be severe or serious, a proper number of men should be detailed for the purpose of rendering prompt assistance to the wounded, and carrying them off the field of battle to the hospitals, or tents, erected for their accommodation and treatment. Unless this be done as a preliminary step, much suffering will inevitably be the consequence, if not great confusion, highly prejudicial to the issue of the combat. So fully aware are the leaders and sub-commanders of our armies of this fact that they never permit any man to fall out of the ranks, during an engagement, to perform this service.

While the battle is progressing it is the duty of the surgeon and of his assistants to remain in the rear of the combatants, as much as possible out of harm's way, but at the same time ready and on the watch to render the promptest possible aid. They must be Argus-eyed, and in the full possession of their wits. One of the leading differences between military and civil practice is the instantaneous action so often demanded by the one and the delay so frequently admitted by the other.

The first duty of every surgeon is to the officers and men of his own corps; but on the field of battle, or soon after the battle is over, he is often brought in contact with the members of other regiments, or even with the wounded of the enemy; and under such circumstances the dictates of humanity, not less than the usages of war, demand that he should render his services wherever they may be likely to be useful. The medical officers of the contending parties sometimes meet upon such occasions, and, when this is the
case, their conduct should invariably be characterized by the courtesy of the gentleman, not the asperity of the enemy. They should not forget that they are brethren of the same noble profession, acting in the capacity of ministering angels to the sick and dying. Country and cause alike should be forgotten in generous deeds.

By the usages of war in all civilized countries, the surgeons are always respected by the enemy if, during an engagement, they happen to fall accidentally into their hands. Their lives are regarded as sacred, the more so, as they are comparatively defenseless. They are not, however, during the rage and smoke of the battle-field, always easily distinguishable from the other officers, or even the common soldiers. The green sash, their distinctive badges of office, does not always afford them immunity, because it is not always recognized; and it is worthy of consideration whether, as an additional safeguard, the word "surgeon" should not be embroidered in legible characters upon a piece of cloth, to be thrown across the chest in time of battle. The significance of such a badge could not be mistaken by friend or foe, and would be the means of saving many valuable lives.

CHAPTER IV.

MEDICAL EQUIPMENTS, STORES AND HOSPITALS.

Every regiment, or body of military men, should be amply provided, in time of war, with the means of conveying the wounded and disabled from the field of battle. For this purpose suitable carriages and litters should constantly be in readiness. The carriages should be built in the form of light wagons, drawn each by two horses; with low wheels, easy springs, and a large wide body, furnished with a soft mattress and pillows, and capable of accommodating not less than eight or ten persons, while arrangements might be made at the side for seating a number more, as in the French voituré. As a means of protection against the sun and the rain, it should have a light cover of oil-cloth or canvass.

A great number of litters, or bearers, will be found described in treatises on military surgery; but I am not acquainted with any which combine so much simplicity and
cheapness, with lightness and convenience, as one which, after a good deal of reflection, I have just devised. It consist of two equal parts, conducted at the ends by stout hinges, the arrangement being such as to permit of their being folded for the more easy transportation on the field of battle. Each part has a side piece of wood, three feet four inches long, by two inches in depth, and an inch and a half in thickness, the free extremity terminating in a slightly curved handle. The side pieces are united by four traverses, and the entire frame is covered with ducking, twenty-four inches in width. Thus constructed, the apparatus is not only very light, so that any one may easily carry it, or, indeed, even three or four at a time, but remarkably convenient both for the transportation of patients, and for lifting them in and out of the wagons, which should always be at hand during and engagement. Moreover, by means of side straps, provided with buckles, it will answer extremely well for a bed-chair, so necessary in sickness and during convalescence, the angle of flexion of the two pieces thus admitting of ready regulation. In carrying the wounded off the field, the labor may easily be performed by two men, especially if they use shoulder-straps to diffuse the weight of the burden. The body, in hot weather, might be protected with an oil-cloth, while the face might be shielded from the sun with a veil or handkerchief. A pillow for the head can be made with the coat of one of the carriers.

Besides these means, every regiment should be furnished with an ambulance, or, as the term literally implies, a movable hospital, that is, a place for the temporary accommodation and treatment of the wounded on the field of battle. It should be arranged in the form of a tent, and be provided with all the means and appliances necessary for the prompt succor of the sufferers. The materials of which it consists should be as light as possible, possess every facility for rapid packing and erection, and be conveyed from point to point by a wagon set apart for this object. The ambulance, for the invention and improvement of which we are indebted to two eminent French military surgeons, Percy and Larrey, is indispensable in every well-regulated army.

This temporary hospital should be placed in an open space, convenient to water, and upon dry ground, with arrangements for the free admission of air and light, which,
next to pure air, is one of the most powerful stimulants in all cases of accident attended with excessive prostration. The direct rays of the sun, in hot weather, must of course be excluded, and it may even be necessary, as in injuries of the head and eye, to wrap the patient in complete darkness. A properly regulated temperature is also to be maintained, a good average being about 68° of Fahrenheit's thermometer.

As engagements are sometimes begun after dark, or are continued into the night, an adequate supply of wax candles should be provided, as they will be found indispensable both in field and hospital practice, in performing operations and dressing wounds and fractures. Torches, too, will frequently be needed, especially in collecting and transporting the wounded. Bed-pans, feeding-cups, spoons, syringes, and other appliances usually found in the sick chamber, will form a necessary part of the furniture of such an establishment.

The object of the ambulance is, as already stated, to afford prompt succor to the wounded. Here their lighter injuries are speedily dressed, and the more grave subjected to the operations necessary for their cure. In due time, the former are sent back to the ranks, while the rest are conveyed to suitable lodgings or to permanent hospitals.

As soon as practicable, after the hurry and confusion attendant upon a combat are over, the surgeon should classify the wounded and disabled, taking care that those laboring under similar lesions are not brought in close contact; lest, witnessing each other's sufferings, they should be seized with fatal despondency.

Larrey, in order to meet the exigencies of the grand army in Italy, constructed a flying ambulance: an immense, and, at first sight, a very cumbersome establishment. It consisted of twelve light wagons, on easy springs, for the transportation of the wounded; some with two, others with four wheels. The frame of the former, which were designed for flat, level countries, resembled an elongated cube, curved on the top; it had two small windows on each side, with a folding door in front and behind. The floor of the body, separable and movable on rollers, was covered with a mattress and bolster. Handles were secured to it laterally, through which the sashes of the soldiers were passed in lifting the sick in and out of the carriage, when, on account of the weather, their wants could not be relieved on the
ground. Each vehicle was thirty-two inches wide, and was drawn by two horses; it could conveniently accommodate two patients at full length, and was furnished with several side-pockets for such articles as might be needed for the sufferers.

The large carriage, drawn by four horses, and designed for rough and hilly roads, was constructed upon the same principle as the small; it had four wheels, and could accommodate four persons. The left side of the body had two long sliding-doors, extending almost its whole length, so as to permit the wounded to be laid in a horizontal position.

These carriages were used for conveying the wounded from the field of battle to the hospitals of the lines, and combined, it is said, solidity with lightness and elegance.

The number of men attached to the flying ambulance was 113, embracing a soldier's guard with twelve men on horseback, a quartermaster-general, a surgeon-major, with his two assistants and twelve mates, a police officer, and a number of servants. The flying ambulance was, in fact, a costly and imposing establishment, devised by the humanity and ingenuity of the great and good Larrey, who could never do too much for the wounded soldier, and whose presence, like that of his illustrious countryman, Pare, always served to animate the French troops. At one time three divisions of the flying ambulance, equipped upon this grand scale, were upon the field in different parts of Italy.

It is not deemed necessary in a work like this, to give an account of the construction of hospitals, properly so termed; for, with the railroad and steamboat facilities which we now possess, there can be little difficulty in obtaining comfortable accommodations for the sick and wounded soldiers. Lodgings can almost always be procured, in nearly every portion of the country where a battle is likely to be fought, in houses, churches, and barns. Temporary sheds might easily be erected in a few hours, with such arrangements as would serve for the more pressing wants of the wounded. The chief points to be attended to, in their construction, are sufficient elevation of the ground floor for the free circulation of air, windows for light and ventilation, and such a position of the fire-place as not to annoy the inmates.

The medical stores of the military hospital, whether tem-
porary or permanent, include medicines, instruments, and various kinds of apparatus, as bandages, oiled silk, and splints.

It would far transcend my limits were I to enter fully into all the details connected with these different topics. A few brief remarks under each head must suffice for my purpose.

1st. In regard to medicines, a few articles only, well selected and arranged for ready use, will be necessary. It is bad enough, in all conscience, for a man to be severely shot or stabbed, without physicking him to death. Let him by all means have a chance for his life, especially when he has already been prostrated by shock and hemorrhage. Food and drink, with opium and fresh air, will then do him more good than anything else. I shall enumerate the medicines upon which, in my judgment, most reliance is to be placed in this kind of practice, according to their known effects upon the system.

1. Anodynes:—opium, morphia, and black drop, or acetated tincture of opium.
2. Purgatives:—blue mass, calomel, rhubarb, jalap, compound extract of colocynth, and sulphate of magnesia. Some of these articles should be variously combined, and put up in pill form for ready use.
3. Depressants:—tartrate of antimony and potassa, ipecacuanha, and tincture of veratrum viride.
4. Diaphoretics:—antimony, ipecacuanha, nitrate of potassa, morphia, and Dover’s powder.
5. Diuretics:—nitrate and carbonate of potassa, and colchicum.
6. Antiperiodics:—quinine and arsenic.
7. Anaesthetics:—chloroform and ether.
8. Simulants:—brandy, gin, wine, and aromatic spirits of ammonia.
9. Astringents:—acetate of lead, perchloride of iron and alum, tannin, gallic acid, and nitrate of silver.
10. Escharotics:—nitric acid, acid nitrate of mercury, (Bennett’s formula,) and Vienna paste.

2d. The surgical armamentarium should also be as simple as possible. It should embrace a small pocket case, with a screw catheter; a full amputating case, with at least three tourniquets, two saws of different sizes, and several large bone-nippers; and, lastly, a trephining case. Several silver catheters of different sizes, a stomach pump, small and
large syringes, feeding-cups and bed-pans should also be put up.

3d. Under the head of apparatus may be included bandages, lint, linen, adhesive plaster, splints, cushions, wadding, and oiled silk.

The bandages, composed of tolerably stout muslin, should be free from starch and selvage, well rolled, on an average, from two inches and a quarter to two inches and a half in width by eight yards in length. The bandage of Scultetus, very serviceable in compound fractures, can easily be made, as occasion may require, out of pieces of the common roller.

Of lint, the patent, or apothecary's, as it is termed, is the best, as it is soft and easily adapted to the parts to which it is intended to be applied. Old linen or muslin also answers sufficiently well. Charpie is now seldom used.

An abundance of adhesive plaster, put up in small cases, should be provided. Collodion will not be necessary.

Splints, of binders or trunk-maker's board, and of light wood, should find a place in every medical store, as frequent occasions occur for their use. In fractures of the lower extremity special apparatus may be required, which, however, as it is cumbersome and inconvenient to carry, may generally be prepared as it is needed.

Cushions are made of muslin, sewed in the form of bags, of variable size and shape, and filled with cotton, tow, sawdust or sand. They are designed to equalize and ward off pressure in the treatment of fractures of the lower extremities.

Wadding is a most valuable article in surgical practice, both for lining splints and making pads, as well as in the treatment of burns and scalds, and cannot be dispensed with.

Oiled Silk is a prominent article in the dressings of the present day; it preserves the heat and moisture of poultices and of warm water-dressings, at the same time that it protects the bed and body-clothes of the patient.

Oil-cloth, soft and smooth, is required in all cases of severe wounds and fractures, attended with much discharge.

Air-cushions should be put up in considerable numbers, as their use will be indispensable in all cases of disease and injury involving protracted confinement.

Bran and sawdust will be found of great value in the treatment of compound fractures, ulcers, gangrene, and
suppurating wounds, as an easy support for the injured limb and a means of excluding flies.

Medical case-books should be put up along with the other articles, for the accurate registration of the names of the sick and wounded, the nature of their lesions, and the results of treatment. The medical officers should also keep a faithful record of the state of the weather, the temperature of the air, the nature of the climate, the products of the soil, and the botany of the country through which they or in which they sojourn, together with such matters as may be of professional or scientific interest. The knowledge thus acquired should be disseminated after their return for the benefit of their professional brethren.

Finally, in order to complete hospital equipments, well-trained nurses should be provided; for good nursing is indispensable in every case of serious disease, whatever may be its character. The importance of this subject, however, is now so well appreciated as not to require any special comments here.

The question as to whether this duty should be performed by men or women is of no material consequence, provided it be well done. The eligibility of women for this task was thoroughly tested in the Crimea, through the agency of that noble-hearted female, Florence Nightingale; and hundreds of the daughters of our land have already tendered their services to the government for this object. No large and well regulated hospital can get on without some male nurses, and they are indispensable in camp and field practice.

It is not my purpose here to point out the qualities which constitute a good female nurse. It will suffice to say that she should be keenly alive to her duties, and perform them, however menial or distasteful, with promptness and alacrity. She must be tidy in her appearance, with a cheerful countenance, light in her step, noiseless, tender and thoughtful in her manners, perfect mistress of her feelings, healthy, able to bear fatigue, and at least twenty-two years of age. Neither the crinoline nor the silk dress must enter into her wardrobe; the former is too cumbrous, while the latter by its rustling is sure to fret the patient and disturb his sleep. Whispering and walking in on tiptoe, as has been truly observed by Florence Nightingale, are an abomination in the sick chamber. Finally, a good nurse never fails to anticipate all, or nearly all, the more important wants of the sufferer.

Among other things to be specially attended to in nurs-
ing is ventilation. Persons visiting the sick must at once be struck with the difference of pure air in those chambers where a proper ventilation exists and those where the reverse is the case. To insure this the fresh air should always be admitted from a window not open directly on the bed, or causing the patient to be in a draught. Even in winter it is highly proper that fresh air should be admitted some time during the day when there is a good fire and the patient well protected by covering.

The pillows, bedding, and bedclothes should be well aired and often changed, as also the flannel, under-garments, and night-dress. To facilitate this, it is well, when the patient is very ill and unable to help himself, to have the shirt open all the way down in front, and buttoned up. The patient often escapes great suffering and annoyance by this simple method. Where there is a discharge from the sores, or when water-dressing are applied to a limb, it is advisable to place the latter upon a folded sheet with a thin, soft oil-cloth underneath. Great tenderness and cleanliness should be used in dressing wounds or sores. Old linen, muslin, and lint should always be had in readiness for this purpose. A great prejudice exists against the use of muslin, the preference being generally given to linen, but the former is really quite as good as the other, if it is soft and old.

In regard to the cleanliness of a sick-room, it is advisable to use a mop occasionally for the removal of flue from under the bed; when, however, the patient is in too critical a situation for dampness, a few tea-leaves scattered over the apartment will absorb the dust, and can be quietly taken up with a hand-brush. A frequent change of bed-linen is very beneficial when practicable, and the clothes must always be folded smoothly under the patient. Great cleanliness should be observed in all the surroundings of the sick-room, and particular attention must be paid to the glasses in which medicine is given, in order to render the doses as palatable as possible. The patient should be washed whenever able, and his teeth and hair well attended to. The body seems infused with new vigor after such ablutions.

A frequent change of posture is immensely conducive to the comfort and well-being of a sick person, if performed with a careful eye to his particular condition. Severe pain, loss of sleep, excessive constitutional irritation, and dread-
ful bed-sores are sure to follow, in all low states of the system, if this precaution be not duly heeded. No patient must have his head suddenly raised, or be permitted to lie high, when he is exhausted from shock, hemorrhage, or sickness. Many lives have been lost by this indiscretion.

The apartment must be free from noise, the light should neither be too freely admitted nor too much excluded, except in head and eye affections, and the temperature must be regulated by the thermometer, from 65° to 68° of Fahrenheit being a proper average.

As the patient acquires strength, he may gradually sit up in bed, propped up at first by pillows, and afterward by a bed-chair.

His food and drink, and also, at times, his medicine, must be given from a feeding-cup during the height of his disease, and a good general rule is to administer them with great regularity, provided this does not interfere too much with his repose. If he is very weak, and sleeps very long, it will be necessary to wake him in order to give him nourishment; but, in general, sleep is more refreshing than food, and more beneficial than medicine. The bed-pan and urinal of course find their appropriate sphere under such circumstances.

As the appetite and strength increase, the patient is permitted to resume, though very gradually, his accustomed diet and to exercise about the room, if not in the open air. After severe accidents and protracted sickness, a wise man will not bestir himself too soon or too much, but court the fickle goddess of health with becoming caution.

Dying patients should be carefully screened from their neighbors, placed in the easiest posture, have free access of air, and be not disturbed by noise, loud talking, or the presence of persons not needed for their comfort. As soon as the mortal struggle is over, the body must be removed.

The exercises should be removed as speedily as possible from the apartment, and the vessels in which they are received immediately well scalded, the air being at the same time perfectly purified by ventilation, or ventilation and disinfectants.

Finally, the nurse must take care of herself. She must have rest, or she will soon break down. If she is obliged to be up all night, she should be spared in the day.
CHAPTER V.

WOUNDS AND OTHER INJURIES.

The injuries inflicted in war are, in every respect, similar to those received in civil life. The most common and important are fractures, dislocations, bruises, sprains, burns, and the different kinds of wounds, as the incised, punctured, lacerated, and gunshot. With the nature, diagnosis, and mode of treatment of these lesions every army surgeon must, of course, be supposed to be familiar; and I shall therefore limit myself, in the remarks which I am about to offer upon these subjects, to a few practical hints respecting their management on the field of battle and in the ambulance.

Most of the cases of fractures occurring on the field of battle are the result of gunshot injury, and are frequently, if not generally, attended by such an amount of injury to the soft parts and also to the bone as to demand amputation. The bone is often dreadfully comminuted, and consequently utterly unfit for preservation. The more simple fractures, on the contrary, readily admit of the retention of the limb, without risk to life.

In transporting persons affected with fractures, whether simple or complicated, the utmost care should be used to render them as comfortable as possible, by placing the injured limb in an easy position, and applying, if need be, on account of the distance to which they have to be carried, or the mode of conveyance, short side splints of binders' board, thin wood, as a shingle, or junks of straw, gently confined by a roller. For want of due precaution the danger to limb and life may be materially augmented. Permanent dressings should be applied at the earliest moment after the patient reaches the hospital. If the fracture be attended with splintering of the bone, all loose or detached pieces should at once be extracted; a proceeding which always wonderfully simplifies the case, inasmuch as it prevents, in a great measure, the frightful irritation and suppuration which are sure to follow their retention. When this point has been properly attended to, the parts should be neatly brought together by suture, and covered with a compress wet with blood. As soon as inflammation arises—not before—water-dressings are employed. A suitable opening, or bracket, should be made in the apparatus to facilitate drainage and dressing.
Dislocations, accidents by no means common in military operations, are treated according to the general rules of practice; they should be speedily reduced, without the aid of chloroform, if the patient is faint or exhausted; with chloroform, if he is strong or reaction has been fully established. The operation may generally be successfully performed by simple manipulation; if, however, the case is obstinate, pulleys may be necessary, or extension and counter-extension made by judicious assistants.

Bruises, or contusions, unless attended with pulpitation, isorganization, or destruction of the tissues, are best treated, at first, until the pain subsides with tepid water impregnated with laudanum and sugar of lead, or some tepid astringent lotion, and afterward, especially if the patient be strong and robust, with cold water, or cold astringent fluids. The injury be deep seated, extensive, and attended with action of very important structures, the case will be a serious one, liable to be followed by the worst consequences, requiring, perhaps, amputation.

Sprains are often accompanied with excessive pain and even severe constitutional symptoms. They should be treated with the free use of anodynes and with warm waterings medicated with laudanum, or laudanum and lead. The joint must be elevated and kept at rest in an easy position. Leeches may be applied, if they can be obtained; otherwise, if plethora exist, blood may be taken from the arm. By-and-by sorbent facient liniments and friction come in play. Passive motion should not be instituted too soon.

Among the accidents of war are burns, and, occasionally, scalds. The former may be produced by ordinary fire by the explosion of gunpowder, either casual or from the owing up of redoubts, bridges, houses, or arsenals, and by from the trivial to the most serious lesions, involving great extent of surface or of tissue, and liable to be followed by the worst consequences. Such injuries always require prompt attention; for, apart from the excessive pain and collapse which so often accompany them, the longer they remain uncared for the more likely will they be to end badly.

Various remedies have been proposed for these injuries, have myself always found white-lead paint, such as that employed in the arts, mixed with linseed oil to the consistence of very thick cream, and applied so as to form a com-
plete coating, the most soothing and efficient means. The dressing is finished by enveloping the parts in wadding, confined by a moderately tight roller. It should not be removed, unless there is much discharge or swelling, for several days. If vesicles exist, they should previously be opened with a needle or the point of a bistoury. A liniment or ointment of glycerin, lard or simple cerate, and subnitrate of bismuth, as suggested by my friend, Professor T. G. Richardson, of New Orleans, is also an excellent remedy, and may be used in the same manner as the white lead paint. In the milder cases, carded cotton, cold water, and alcohol, water and laudanum, generally afford prompt relief. Amputation will be necessary when there is extensive destruction of the muscles, bones or joints. Reaction must be promoted by the cautious use of stimulants; while pain is allayed by morphia or laudanum given with more than ordinary circumspection, lest it induce fatal oppression of the brain.

In burns from the explosion of gunpowder, particles of this substance are often buried in the skin, where, if it be not removed, they leave disfiguring marks. The best way to get rid of them is to pick out grain after grain with the point of a narrow-bladed bistoury or cataract needle.

The subject of wounds is a most important one in regard to field practice, as these lesions are not only of frequent occurrence, but present themselves in every variety of form and extent. Their gravity is influenced by numerous circumstances which our space does not permit us to specify, but which the intelligent reader can readily appreciate. In many cases death is instantaneous, owing to shock, or shock and hemorrhage; in others it occurs gradually with or without reaction, at a period of several hours, or, it may be, not under several days. Sometimes men are destroyed by shock, by, apparently, the most insignificant wound or injury, owing, not to want of courage, but to some idiosyncracy.

The indications presented in all wounds, of whatever nature, are—1st, to relieve shock; 2dly, to arrest hemorrhage; 3dly, to remove foreign matter; 4thly, to approximate and retain the parts; and, 5thly, to limit the resulting inflammation.

1. It is not necessary to describe minutely the symptoms of shock, as the nature of the case is sufficiently obvious at first sight, from the excessive pallor of the countenance, the
weakened or absent pulse, the confused state of the mind, the nausea, or nausea and vomiting, and the excessive bodily prostration. The case must be treated promptly; by free access of fresh air and the use of the fan, by loosening the dress or the removal of all sources of constriction, by dashing cold water into the face and upon the chest, by recumbency of the head, and by draught of cold water, or water and spirits, wine or harts horn, if the patient can swallow; aided, if the case be urgent, by sinapisms to the region of the heart, the inside of thighs and the spine, and stimulating injections, as brandy, turpentine, mustard, or ammonia, in a few ounces of water. No fluid must be put into the mouth so long as the power of deglutition is gone, lest some of it should enter the windpipe, and so occasion suffocation. Whatever the cause of the shock may have been, let the medical attendant not fail to encourage the sufferer by a kind and soothing expression, which is often of more value in recalling animation than the best cordials.

During an actual engagement, the medical officers, as well as their servants, should carry in their pockets such articles as the wounded will be most likely to need on the field of battle, as brandy, aromatic spirits of harts horn, and morphia, put up in suitable doses.

2. The hemorrhage may be arterial or venous, or both arterial and venous, slight or profuse, primary or secondary, external or internal. The scarlet color and saltatory jet will inform us when it is arterial; the purple hue and steady flow, when it is venous. When the wound is severe, or involving a large artery or vein, or even middle-sized vessels, the bleeding may prove fatal in a few minutes unless immediate assistance is rendered. Hundreds of persons die on the field of battle from this cause. They allow their life current to run out, as water pours from a hydrant, without an attempt to stop it by thrusting the finger in the wound, or compressing the main artery of the injured limb. They perish simply from their ignorance, because the regimental surgeon has failed to give the proper instruction. It is not necessary that the common soldier should carry a Petit's tourniquet, but every one may put into his pocket a stick of wood, six inches long, and a handkerchief or piece of roller, with a thick compress, and be advised how, where, and when they are to be used. By casting the handkerchief round the limb, and placing the compress over its main artery, he can, by means of the stick, produce such
an amount of compression as to put at once an effectual stop to the hemorrhage. This simple contrivance, which has been instrumental in saving thousands of lives, constitutes what is called the *field tourniquet*. A file, drum-stick, knife or ramrod may be used, if no special piece of wood is at hand.

The most reliable means for arresting hemorrhage permanently is the ligature, of strong, delicate, well-waxed silk, well applied, with one end cut off close to the knot. Acupressure is hardly a proper expedient upon the battle-field, or in the ambulance, especially when the number of wounded is considerable. The rule invariably is to tie a wounded artery both above and below the seat of injury, lest recurrent bleeding should arise. Another equally obligatory precept is to ligature the vessels, if practicable, at the place whence the blood issues, by enlarging, if need be, the original wound. The main trunk of the artery should be secured only when it cannot be taken up at the point just mentioned. Lastly, it is hardly requisite to add that the operation should be performed, with the aid of the tourniquet, as early as possible, before the supervention of inflammation and swelling, which must necessarily obscure the parts and increase the surgeon's embarrassment, as well as the patient's pain and risk.

Venous hemorrhage usually stops spontaneously, or readily yields to compression, even when a large vein is implicated. The ligature should be employed only in the event of absolute necessity, for fear of inducing undue inflammation.

*Torsion* is unworthy of confidence in field practice, and the same is true of *styptics*, except when the hemorrhage is capillary, or the blood oozes from numerous points. The most approved articles of this kind are Monsel's salt, or the persulphate of iron and the perchloride of iron; the latter deserving the preference, on account of the superiority of its hemostatic properties. Alum and lead are inferior styptics.

Temporary *compression* may be made with the tourniquet, or a compress and a roller. It may be direct, as when the compress is applied to the orifice of the bleeding vessel, or indirect, as when it is applied to the trunk of the vessel, at some distance from the wound.

Constitutional treatment in hemorrhage is of paramount importance. It comprises perfect tranquility of mind and
body, cooling drinks, a mild, concentrated nourishing diet, especially when there has been excessive loss of blood, anodynes to allay pain, induce sleep, and allay the heart’s inordinate action, fresh air, and a properly regulated light.

Internal hemorrhage is more dangerous than external, because it is generally inaccessible. The chief remedies are copious venesection, elevated position, opium and acetate of lead, cool air, and cool drinks.

Exhaustion from hemorrhage should be treated according to the principles which guide the practitioner in cases of severe shock. Opium should be given freely as soon as reaction begins to quiet the tremulous movements of the heart and tranquilize the mind. When the bleeding is internal, the reaction should be brought about gradually, not hurriedly, lest we thus become instrumental in promoting or re-exciting the hemorrhage.

Secondary hemorrhage comes on at a variable period, from a few hours to a number of days; it may depend upon imperfect ligation of the arteries, ulceration, softening or gangrene of the coats of these vessels, or upon undue constriction of the tissues by tight bandages. In some cases it is venous, and may then be owing to inadequate support of the parts. Whatever the cause may be, it should be promptly searched out and removed.

3. The third indication is to remove all foreign matter. This should be done at once and effectually; with sponge and water, pressed upon the parts, with finger, or finger and forceps. Not a particle of matter, not a hair, or the smallest clot of blood must be left behind, otherwise it will be sure to produce and keep up irritation.

4. As soon as the bleeding has been checked and the extraneous matter cleared away, the edges of the wound are gently and evenly approximated and permanently retained by suture, and adhesive plaster, aided, if necessary, by the bandage. The best suture, because the least irritating, is that made of silver wire; but if this material is not at hand, strong, thin, well-waxed silk is used. The adhesive strips are applied in such a manner as to admit of free drainage. The bandage is required chiefly in injuries extending deeply among the muscles; when this is the case, its use should be aided by compresses arranged so as to force together the deep parts of the wound.

5. When the wound is dressed, the next duty of the surgeon is to moderate the resulting inflammation. For this
purpose the ordinary antiphlogastic means are employed. In general, very little medicine will be required, except a full anodyne, as half a grain of morphia, immediately after the patient has sufficiently recovered from the effects of his shock, and perhaps a mild aperient the ensuing morning, especially if there be constipation with a tendency to excessive reaction. The drinks must be cooling, and the diet light and nutritious, or otherwise, according to the amount of depression and loss of blood. In the latter event, a rich diet and milk-punch may be required from the beginning. A diaphoretic draught will be needed if the skin is hot and arid, aided by frequent sponging of the surface with cool or tepid water. General bleeding will rarely, if ever, be required; certainly not if the injury is at all severe, or if there has already been any considerable waste of blood and nervous power.

Much trouble is, at times, experienced both in civil and military practice, especially in very hot weather, in preventing the access of flies to our dressing. The larvae which they deposit are rapidly developed into immense maggots, which, creeping over the wounds and sores of the patient, and gnawing the parts, cause the most horrible distress. The soldiers in Syria, under Larrey, were greatly annoyed by these insects, and our wounded in Mexico also suffered not a little from them. The best prevention is bran, or light saw-dust, with which the injured parts should be carefully covered. The use of cotton must be avoided, inasmuch as it soon becomes hot and wet; two circumstances highly favorable to incubation.

The best local applications are the water-dressings, either tepid, cool, or cold, according to the temperament of the patient, the tolerance of the parts, and the season of the year. Union by the first intention is, in all the more simple cases, the thing aimed at and steadily kept in view, and hence the less the parts are encumbered, moved or fretted, the more likely shall we be to attain the object.

The medical attendant should have a constant eye to the condition of the bladder after all severe injuries, of whatever character, as retention of urine is an extremely common occurrence, and should always be promptly remedied. Attention to this point is the more necessary, because the poor patient, in his comatose or insensible condition, is frequently unable to make known his wants.

Such, in a few words, are the general principles of treat-
ment to be followed in all wounds; but there are some wounds which are characterized by peculiarities, and these peculiarities are of such practical importance as to require separate consideration. Of this nature are punctured, lacerated, and gunshot wounds.

Punctured wounds are inflicted by various kinds of weapons, as the lance, sabre, sword, or bayonet. In civil practice, they are most generally met with as the result of injuries inflicted by nails, needles, splinters, fragments of bone. They often extend into the visceral cavities, joints, vessels, and nerves; and are liable to be followed by excessive pain, erysipelas, and tetanus; seldom heal by adhesive action; and often cause death by shock or hemorrhage. When the vulnerating body is broken off and buried, it may be difficult to find and extract it, especially when small and deep seated. When this is the case, the wound must be freely dilated, an eye being had to the situation of the more important vessels and nerves. In other respects, the general principles of treatment are similar to those of incised wounds. Opium should be administered largely; and, if much tension supervene, or matter form, free, incisions will be necessary.

In lacerated wounds, the edges should be tacked together very gently, and large interspaces left for drainage. A small portion will probably unite by the first intention; the remainder, by the granulating process. Such wounds nearly always suppurate more or less profusely, and some of the torn and bruised tissues not unfrequently perish. The same bad consequences are apt to follow them as in punctured wounds. Warm water constitutes the best dressing, either alone or with the addition of a little spirits of camphor. Opium should be used freely internally, and the diet must be supporting.

Gunshot wounds, in their general character, partake of the nature of lacerated and contused wounds. They are, of course, the most common and dangerous lesions met with in military practice; often killing instantly, or, at all events, so mutilating the patient as to destroy him within a few hours or days after their receipt. The most formidable wounds of the kind are made by the conical rifle and musket balls and by cannon balls, the latter often carrying away the greater portion of a limb, or mashing and pulpifying the muscles and viscera in the most frightful and destructive manner; while the former commit terrible ravages
among the bones, breaking them into numerous fragments, each of which may, in its turn, tear up the soft tissues, in a way perhaps not less mischievous than the ball itself. The old round ball is a much less fatal weapon than the conical, which seldom becomes flattened, and which has been known to pass through the body of two men and lodge in that of a third some distance off.

When a ball lodges, it makes generally only one orifice; but it should be remembered that it may make two, three, and even four, and at last bury itself more or less deeply. Should the missile escape, there will necessarily be two openings; or, if it meet a sharp bone and be thereby divided or cut in pieces, as sometimes happens, there may be even three. The orifice of entrance and the orifice of exit differ in their appearances. The first is small, round, and often a little discolored from the explosion of the powder; the other, on the contrary, is comparatively large, slit-like, everted, and free from color. These differences, however, are frequently very trifling, particularly if the ball be projected with great velocity and it do not encounter any bone. The opening of entrance made by the round ball is often a little depressed or inverted, but such an appearance is extremely uncommon in wounds made by the conical ball.

It is often a matter of great importance to determine when two openings exist in a limb, whether they have been made by one ball, which has passed out, or by two balls, which are retained. The question is of grave importance, both in a practical and in a medico-legal point of view; but its solution is, unfortunately, not always possible. Sometimes the openings of entrance and exit are materially modified by the introduction but non-escape of a foreign body, as a piece of breast-plate, belt or buckle, along with the ball, which alone passes out, or by the flattening of a ball against a bone, or its division by a bone into several fragments, each of which may afterward produce a separate orifice. Generally speaking, the missile, at the place of entrance, carries away a piece of skin, and rends the skin where it escapes, the former being often found in the wound.

Bullets sometimes glance, bruising the skin, but not penetrating it; at other times they effect an entrance, but, instead of passing on in a straight line, are deflected, courting, perhaps, partially round the head, chest, or abdomen, or round a limb. Such results are most commonly caused
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by a partially spent bullet coming in contact with bones, aponeuroses, and tendons; and the round is more frequently served in this way than the conical.

Gunshot wounds bleed profusely only when a tolerably large artery has been injured, and in this event they may speedily prove fatal. During the Crimean war, however, many cases occurred in which there was no immediate hemorrhage, imperiling life, notwithstanding the limbs, lower as well as upper, were left hanging merely by the integuments. Under such circumstances, intermediary hemorrhage, as it is termed, is apt to show itself as soon as reaction takes place; generally within a few hours after the accident.

The pain is of a dull, burning, smarting, or aching character, and the patient is pale, weak, tremulous, nauseated, and despondent, often in a degree far beyond what might be expected from the apparent violence of the injury. and that, too, perhaps, when the individual is of the most undaunted courage and self-possession in the heat of battle. At other times a man may have a limb torn off, or be injured in some vital organ, and yet hardly experience any shock whatever: nay, perhaps be scarcely conscious that he is seriously hurt. The pain and prostration are always greater, other things being equal, when a bone has been crushed or a large joint laid open, than when there is a mere flesh wound.

The gravity of gunshot wounds of the joints has been recognized by all practitioners, both military and civil, from time immemorial. The principal circumstances of the prognosis are the size and complexity of the articulation, the extent of the injury, and the state of the system. A gunshot wound of a ginglymoid joint is, in general, a more dangerous affair than a similar one of a ball-and-socket joint. The structures around the articulation often suffer severely, thus adding greatly to the risk of limb and life. Of 65 cases of gunshot wounds of different joints, related by Alcock, 33 recovered; but of these 21 lost the limb. Of the 32 that died no operation was performed upon 18.

Gunshot wounds of the smaller joints, even those of the ankle, often do very well, although they always require long and careful treatment. Lesions of this kind, involving the shoulder, are frequently amenable to ordinary means. If the ball lodges in the head of the humerus, it must be extracted without delay, its retention being sure to excite
violent inflammation in the soft parts, and caries or necrosis in the bone, ultimately necessitating amputation, if not causing death.

Gunshot wounds of the knee-joint are among the most dangerous of accidents, and no attempt should be made to save the limb when the injury is at all extensive, especially if it involves fracture of the head of the tibia or condyles of the femur. Even extensive laceration of the ligament of the patella should, I think, as a general rule, be regarded as a sufficient cause of amputation. In 1854, Macleod saw upwards of forty cases of gunshot wounds of the knee in the French hospitals in the Crimea, and all, except one, in which an attempt was made to save the limb, proved fatal. Of nine cases which occurred in India, not one was saved. Guthrie never saw a patient recover from a gunshot wound of the knee-joint; and Esmarch, who served in the Schleswig-Holstein wars, expressly declares that all lesions of this kind demand immediate amputation of the thigh.

When, in bad cases of these articular injuries, an attempt is made to save the limb, the patient often perishes within the first three or four days, from the conjoined effects of shock, hemorrhage, and traumatic fever. If he survives for any length of time, large abscesses are apt to form in and around the joint, the matter burrowing extensively among the muscles, and causing detachment of the periosteum with caries and necrosis of the bones.

Muscles, badly injured by bullets, generally suppurate, and are very apt to become permanently useless. Special pains should therefore be taken to counteract this tendency during the cure. Large shot and other foreign bodies sometimes lodge among these structures, where their presence may remain for a long time unsuspected.

Cannon balls often do immense mischief by striking the surface of the body obliquely, pulpifying the soft structures, crushing the bones, lacerating the large vessels and nerves, and tearing open the joints, without, perhaps, materially injuring the skin.

A very terrible form of contusion is often inflicted upon the upper extremity of artillerymen by the premature explosion of the gun while in the act of loading; causing excessive commotion of the entire limb, laceration of the soft parts, and most extensive infiltration of blood, accompanied, in many cases, by comminuted fracture, and penetration of the wrist and elbow joints. The constitutional shock is frequent-
ly great. If an attempt be made to save the parts, diffusive suppuration, and more or less gangrene, will be sure to follow, bringing life into imminent jeopardy. An attempt in such a case to save the limb would be worse than useless, if, indeed, not criminal; amputation must be promptly performed, and that at a considerable distance above the apparent seat of the injury, otherwise mortification might seize upon the stump.

In the treatment of this class of injuries, the first thing to be done, after arresting the hemorrhage and relieving shock, is to extract the ball and any other foreign substance that may have entered along with it, the next being to guard against inflammation and other bad consequences.

In order to ascertain where the ball is, the limb should be placed as nearly as possible in the position it was supposed to have been at the moment of the accident. A long, stout, flexible, blunt-pointed probe, or a straight silver catheter, is then passed along the track and gently moved about until it strikes the ball. In many cases the best probe is the surgeon's finger. Valuable information may often be obtained by the process of pinching or digital compression, the ends of the fingers being firmly and regularly pressed against the wounded structures, bones as well as muscles, tendons, and aponeuroses. Occasionally, again, as when a ball is lodged in an extremity, its presence is easily detected by the patient, who may make such an examination as he lies in bed.

The situation of the foreign body having been ascertained, the bullet-forceps take the place of the probe, the blades, which should be long and slender, being closed until they come in contact with the ball, when they are expanded so as to grasp it, care being taken not to include any of the soft tissues. If there be any loose or detached splinters of bone, wadding, or other foreign material, it should now also be removed; it being constantly borne in mind that, while a ball may occasionally become encysted, and is at all times, if smooth, a comparatively harmless tenant, such substances always keep up irritation, and should, therefore, if possible, be got rid of without delay.

Although preference is commonly given to the bullet-forceps, properly so called, as an extractor, the polypus and dressing-forceps, generally answer quite as well, especially the former, the latter being adapted only to cases where the foreign body is situated a short distance below the surface, or where the wound is of unusual dimensions, admitting of the free play of the instrument.

During the extraction, the parts should be properly sup-
ported, and if the wound is not large enough for the expansion of the instrument, it must be suitably enlarged. When the ball is lodged a short distance from the skin, it may often be readily reached by a counter-opening.

When a bullet is embedded in a bone, as in the head of the tibia, or in the condyles of the femur, and the parts are not so much injured as to demand amputation, extraction may be effected with the aid of the trephine and elevator. Sometimes a bullet-worm, as it is termed, an instrument similar to that used in drawing a ball from a gun, will be very convenient for its removal.

The operation being completed, the parts are placed in an easy, elevated position, and enveloped in tepid, cool or cold water-dressings, as may be most agreeable to them and to the system. The best plan, almost always, is to leave the opening or openings, made by the ball, free, to favor drainage and prevent pain and tension. If the track be very narrow, it may heal by the first intention, but in general it will suppurate, and portions of tissue may even mortify. Erysipelas, pyemia, and secondary hemorrhage are some of the bad consequences after gunshot injuries, the latter usually coming on between the fifth and ninth day, the period of the separation of the sloughs.

CHAPTER VI.

AMPUTATIONS AND RESECTIONS.

In endeavoring to decide so important a question as the loss of a limb, various circumstances are to be considered, as the age, habits and previous health of the patient, the kinds of injury, and the number, nature, and importance of the tissues involved. In military practice amputation must often be performed in cases where in civil practice it might be avoided.

It may be assumed, as a rule, that young adults bear up under severe accidents and operations, other things being equal, much better than children and elderly subjects; the strong than the feeble; the temperate than the intemperate; the residents of the country than the inhabitants of the crowded city.

The following circumstances may be enumerated as justifying, if not imperatively demanding, amputation in cases of wounds, whatever may be their nature:
1st. When a limb has been struck by a cannon ball or run over by a railroad car, fracturing the bones, and tearing open the soft parts, amputation should, as a general rule, be performed, even when the injury done to the skin and vessels is apparently very slight, experience having shown that such accidents seldom do well, if an attempt is made to save the limb, the patient soon dying of gangrene, pyemia, or typhoid irritation. The danger of an unfavorable termination in such a case is always greater when the lesion affects the lower extremity than when it involves the superior.

2d. No attempt should be made to save a limb when, in addition to serious injury done to the integuments, muscles or bones, its principal artery, vein or nerve has been extensively lacerated, or violently contused, as the result will be likely to be gangrene, followed by death.

3d. A lacerated or gunshot wound penetrating a large joint, as that of the knee or ankle, and accompanied by comminuted fracture, or extensive laceration of the ligaments of the articulation, will, if left to itself, be very prone to terminate in mortification, and is therefore a proper case for early amputation.

4th. Gunshot wounds attended with severe comminution of the bones, the fragments being sent widely around among the soft parts, lacerating and bruising them severely, generally require amputation, especially in naval and military practice.

5th. Extensive laceration, contusion, and stripping off of the integuments, conjoined with fracture, dislocation, or compression and pulpitification of the muscles, will, in general, be a proper cause for the removal of a limb. *

Amputation is not to be performed, in any case, until sufficient reaction has taken place to enable the patient to bear the additional shock and loss of blood. As long as he is deadly pale, the pulse small and thready, the surface cold, and the thirst, restlessness, and jactitation excessive, it is obvious that recourse to the knife must be wholly out of the question.—The proper treatment is recumbency, with mild stimulants, sinapisms to the extremities, and other means calculated to re-excite the action of the heart and brain. Power being restored, the operation, if deemed necessary, is proceeded with, due regard being had to the prevention of shock and hemorrhage, the two things now mainly to be dreaded.

One of the great obstacles about immediate amputation is the difficulty which the surgeon so often experiences in res-

pect to the cases demanding the operation, and the uncertainty that none of the internal organs have sustained fatal injury; a circumstance which would, of course, contra-indicate the propriety of such interference.

Cases occur, although rarely, where, notwithstanding the most violent injury, or perhaps, even the loss of a limb, there is hardly any appreciable shock, and, in such an event, the operation should be performed on the spot.

The results of the military surgery in the Crimea show that the success of amputations was very fair when performed early, but most unfortunate when they were put off for any length of time. This was the case, it would seem, both in the English and French armies.

Should amputation ever be performed in spreading gangrene? The answer to this question must depend upon circumstances. We may give our sanction when the disease, although rapid, is still limited, and when the patient, comparatively stout and robust, has a good pulse, with no serious lesion of a vital organ and no despair of his recovery, but a cheerful, buoyant mind, hopeful of a favorable issue. No operation is to be done when the reverse is the case; if it be, the patient will either perish on the table, from shock and hemorrhage, or from a recurrence of mortification in the stump.

Lacerated, contused and gunshot wounds are often of so frightful a nature as to render it perfectly certain, even at a glance, that the limb will be obliged to be sacrificed in order that a better chance may be afforded for preserving the patient's life. At other times, the injury, although severe, may yet, apparently, not be so desperate as to preclude, in the opinion of the practitioner, the possibility of saving the parts, or, at all events, the propriety of making an attempt to that effect. The cases which may reasonably require and those which may not require interference with the knife, are not always so clearly and distinctly defined as not to give rise, in very many instances, to the most serious and unpleasant apprehension, lest we should be guilty, on the one hand, of the sin of commission, and, on the other, of that of omission; or, in other, and more comprehensive terms, that while the surgeon endeavors to avoid Scylla, he may not unwittingly run into Charybdis, mutilating a limb that might have been saved, and endangering life by the retention of one that should have been promptly amputated. It is not every man, however large his skill and experience, that is always able to satisfy himself, even after the most profound deliberation, what line of conduct should be pursued in these trying circumstances:
hence the safest plan for him generally is to procure the best counsel that the emergencies of the case may admit of. But in doing this, he must be careful to guard against procrastination; the case must be met promptly and courageously; delay even of a few hours may be fatal, or at all events, place limb and life in imminent jeopardy. Above all, let proper caution be used if the patient is obliged to be transported to some hospital, or to a distant home, that he may not be subjected to unnecessary pain, exposed to loss of blood, or carried in a position incompatible with his exhausted condition. Vast injury is often done in this way, by ignorant persons having charge of the case, and occasionally even by practitioners whose education and common sense should be a sufficient guarantee against such conduct.

Little need be said here about the methods of amputation. In cases of emergency, where time is precious, and the number of surgical inadequate, the flap operation deserves, in my opinion, a decided preference over the circular, and, in fact, every other. The rapidity with which it may be executed, the abundant covering which it affords for the bone, and the facility with which the parts unite are qualities which strongly recommend it to the judgment of the military surgeon. The flaps should be long and well shaped, and care taken to cut off the larger nerves on a level with the bone, in order to guard against the occurrence of neuralgia after the wound is healed. Whatever method be adopted, a long stump should be aimed at, that it may afford a good leverage for the artificial substitute. No blood should be lost during or after the operation, and hence the main artery of the limb should always be thoroughly compressed by a tourniquet, not by the fingers of assistants, who are seldom, if ever, trustworthy on such occasions.

Anaesthetics should be given only in the event of thorough reaction; so long as the vital powers are depressed and the mind is bewildered by shock, or loss of blood, their administration will hardly be safe, unless the greatest vigilance be employed, and this is not always possible on the field of battle, or even in the hospital. Moreover, it is astonishing what little suffering the patient generally experiences, when in this condition, even from a severe wound or operation.

In the war in the Crimea, the British used chloroform almost universally in their operations; the French also exhibited it very extensively, and Baudens, one of their leading military surgical authorities, declares that they did not meet with one fatal accident from it, although it was given by 36.
them, during the Eastern campaign, thirty thousand times at least. The administration of chloroform is stated by Macleod to have contributed immensely to the success of primary amputations.

The dressings should be applied according to the principles laid down under the head of wounds. The sutures, made with silver wire or fine silk, should not be too numerous, and the adhesive strips must be so arranged as to admit of thorough drainage. A bandage should be applied from above downward, to control muscular action and afford support to the vessels; the stump rest upon a pillow covered with oil-cloth, and the water-dressing be used if there is danger of overaction. Pain and spasm are allayed by anodynes; traumatic fever, by mild diaphoretics. Copious purging is avoided; the drink is cooling; and the diet must be in strict conformity with the condition of the patient's system. The first dressings are removed about the end of the third day; after that once or even twice a day, according to the nature and quantity of the discharges, accumulation and bagging being faithfully guarded against.

The following statistics of amputations, both in the continuity of the limbs and of the articulations, possess peculiar interest for the military surgeon. They are derived chiefly from a review which I published of Mr. Macleod's "Notes of the Surgery in the Crimea," in the North American Medico-Chirurgical Review for January, 1860.

The number of cases given by Macleod is 732, with a mortality of 201. Of these, 654 were primary, with 165 deaths, or 26-22 per cent.; and 78 secondary, with 36 deaths, or in the ratio of 46-1. The mortality of the greater amputations—as those of the shoulder, arm, and forearm, and the hip, thigh, knee, and leg—was 39-8 per cent. for the primary operations, and 60 per cent. for the secondary.

The increase of mortality from amputations as we approach the trunk, has long been familiar to surgeons, and the results in the Crimea have not changed our previous knowledge. Thus the ratio of mortality of amputations of the fingers was 0-5; of the forearm and wrist, 1-8; of the arm, 22-9; of the shoulder, 27-2; of the tarsus, 14-2; of the ankle-joint, 22-2; of the leg, 30-3; of the knee-joint, 50-0; of the thigh, in its lower third, 50-0, at its middle, 55-3, at the upper part, 86-8, and at the hip, 100-0. The limb was removed at the latter joint in 101 cases, all of which rapidly proved fatal. The French had 13 cases, primary and secondary, with no better luck.
Legouest has published a table of most of the recorded cases of amputation at the hip-joint, for gunshot wounds. Of these 30 were primary, and all ended fatally; of 11 intermediate, or early secondary, 3 recovered; and of 3 remote, 1 recovered. "Thus," says Macleod, "if we sum up the whole, we have 4 recoveries in 44 cases, or a mortality of 90.9 per cent." Some of the primary cases died on the table; and all the rest, except two, before the tenth day. In the Schleswig-Holstein war, amputation at the hip joint was performed seven times, with one cure. Mr. Sands Cox, recording the experience of civil and military hospitals up to 1846, gives 84 cases, most of them for injury, with 26 recoveries. Dr. Stephen Smith, of New York, has published tables of 98 cases showing a ratio of mortality of 1 in 2.2-3. In 62 of these cases, the operation was performed in 30 for injury, with a mortality of 60 per cent.

Amputation in the upper third of the thigh was performed 39 times, with a fatal result in 34. Of these cases only one was secondary, and that perished. Amputation of the middle third of the limb was performed in 65 cases, of which 38 died. Of these cases 56 were primary, with 31 deaths, giving thus a mortality of 53.3 per cent.; 9 cases were operated upon at a later period, and of these, 7 died, or 77.7 per cent. Amputation of the lower third of the thigh was performed 60 times, 46 being primary, with a mortality of 50 per cent., and 14 secondary, with a mortality of 71.4 per cent.

Amputation at the knee was performed primarily in 6 cases of which 3 died, and once secondarily, with a fatal result. Chelius refers to 37 cases of amputation of the knee, collected by Jäger, of which 22 were favorable; and of 18 cases recorded by Dr. Markoe, of New York, as having occurred in the practice of American surgeons, 13 got well. These cases added together, afford an aggregate of 61, with a mortality of 21, or 34.4 per cent.

The leg was amputated 101 times, with 36 deaths, or a mortality of 35.6 per cent. Of these cases 89 were primary, with 28 deaths, and 12 secondary, with 8 deaths.

Amputation at the ankle-joint was performed in 12 cases, death following in 2. Of these cases 3 were secondary, and all favorable.

The arm was removed at the shoulder joint in 39 cases, with a fatal issue in 13, or 33.3 per cent, 33 being primary, with 9 deaths, and 6 secondary, with a fatal issue in 4. If we couple these cases with 21 that occurred during the previous period of the war, we shall have an aggregate of 60 cases, with 19 deaths, or a mortality of 31.6 per cent. The advan-
tage of primary over secondary amputation of the shoulder has long been known to military surgeons. Thus, of 19 primary cases mentioned by Mr. Guthrie as having occurred between June and September, 1813, 18 recovered, while of 19 secondary cases, 15 died. The experience of the late Dr. Thomson, in Belgium, is equally decisive.

Amputation of the upper arm was performed 102 times, with death in 25 cases, or a mortality of 24.5; 96 of the cases being primary. Of the secondary cases one-half proved fatal.

The forearm was amputated primarily 52 times, and the hand at the wrist once, with only 1 death; while of 7 secondary operations upon the same parts, 2 died.

Resection is one of the aids of conservative surgery, and military practice affords numerous occasions for its employment. The operation, however, is not equally applicable to all the articulations. Resection of the shoulder-joint has hitherto afforded the most flattering results. It is more especially applicable in cases of gunshot injuries, unattended by serious lesion of the vessels and nerves of the limb, or severe laceration of the muscles and integuments. A portion of the humerus, embracing, if necessary, from four to five inches in length, together with a part or even the whole of the glenoid cavity of the scapula, may be safely and expeditiously removed under such circumstances, and yet the patient have an excellent use of his arm.

Williams mentions 19 cases of gunshot wounds of the shoulder-joint in which resection was performed, and of which 3 proved fatal. Baudens saved 13 out of 14 cases, and the British surgeons in the Crimea lost 2 patients out of 27.

Resection of the elbow has of late engaged much attention among military men, and although the results are less flattering than in the operation upon the shoulder, they are, nevertheless, highly encouraging. Of 82 cases which occurred in the Schleswig-Holstein and in the Crimean campaigns, only 16 died, or 1 in about 5.

The wrist-joint has seldom been the subject of excision; doubtless, cases not unfrequently occur in which it might be resorted to with advantage.

Dr. George Williams has collected the history of 11 cases of excision of the hip-joint for gunshot injury, 6 of which occurred in the Crimea. Of this number 10 died. Of 23 amputations at the hip joint by the English and French surgeons in the East; all died.

Excision of the knee-joint for gunshot injury holds out no prospect of advantage, experience having shown that, when
the articulating extremities of the femur and tibia are fractured by a ball, the proper remedy is amputation.

The ankle-joint has been resected in a few instances only for gunshot injuries, and the results have thus far been by no means flattering. When the joint is seriously implicated, amputation will undoubtedly be the more judicious procedure.

Resection of the bones in their continuity is seldom practiced in this class of injuries, and experience has offered nothing in its favor. The operation was performed several times in the Crimea, but proved invariably fatal.

The after-treatment in resection must be conducted upon the same principles as in amputation. The measures must, for the most part, be of a corroborating nature. The limb must be placed in an easy position, and be well supported by a splint or fracture-box, to prevent motion. The operation is liable to be followed by the same bad effects as amputations.

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CHAPTER VII.

ILL CONSEQUENCES OF WOUNDS AND OPERATIONS.

The bad consequences to be apprehended after wounds, amputations, and other operations, are traumatic fever, hemorrhage, excessive suppuration, spasms, erysipelas, gangrene, pyemia, and tetanus.

a. Traumatic fever usually sets in within the first few hours after the injury, or soon after reaction has been fairly established. In camp practice its tendency generally is to assume a low typhoid character, especially if there is much crowding of the sick, with imperfect ventilation and want of cleanliness. Not unfrequently it displays an endemic or epidemic disposition.

The treatment must be exceedingly mild; the patient will not bear depletion, but will notwithstanding his fever, probably require stimulants and tonics, with nutritious food and drink from the very commencement. A gentle anodyne and diaphoretic mixture, as morphia and antimony in camphor-water, may be needful, in the early stage, to quell the fictitious excitement or attempt at overaction.

b. The likelihood of secondary hemorrhage must be steadily kept in view in these cases; much may be done to prevent it by the proper use of the ligature at the time of the operation or dressing, but it is often unavoidable, especially in gunshot wounds, owing to the injury sustained by the coats of the vessels by the grazing of the ball. However induced, it
should receive the most prompt attention, inasmuch as the loss even of a few ounces of blood may prove destructive to the already exhausted system.

c. **Spasms** of the muscles is not peculiar to amputations; it often exists in a most severe degree in cases of fractures and gunshot wounds. Anodynes in full doses, with a little antimony, the use of a moderately-tight bandage, and warm water-dressing, medicated with landanum and acetate of lead, are the most appropriate measures.

d. **Profuse suppuration** may be looked for in nearly all bad wounds, whatever their character, and also in many of the amputations performed on the field of battle. The exhausting effects must be counteracted by supporting remedies, as quinine, iron, cod-liver oil, and brandy, with frequent change of dressing, cleanliness, and ventilation. Bagging is prevented by counter-openings and careful bandaging.

e. **Erysipelas** usually manifests itself within the first thirty-six hours after the injury or operation; often assumes an endemic or epidemic character; is easily distinguished by the peculiar reddish blush rapidly spreading over the surface, together with the stinging or smarting pain and increased swelling; and should be treated with dilute tincture of iodine, or anodyne and saturnine lotions, quinine and tincture of iron, with nutritious food and drinks.

f. **Gangrene** is sufficiently common after severe lesions on the battle-field, especially that variety of it denominated hospital gangrene. During the Crimean war, this form of gangrene raged with extraordinary virulence and fatality among the French in the hospitals on the Bosphorus. It also prevailed about the same period within some of the hospitals in the south of France, and it is asserted that the "Euphrate," a transport ship, in her voyage to the Mediterranean was obliged, from this cause alone, to throw sixty of her men overboard within thirty-six hours! After the taking of the Quarries and the assault upon the Redan, during the heat of summer, in 1855, the English surgeons lost a number of their cases of amputation of the thigh from moist gangrene of a most rapid character, the system having been literally overwhelmed by the poison. When hospital gangrene is endemic, it attacks not only open wounds and sores, but also the slightest scratches, cicatrices, and stumps. Persons laboring under diarrhoea, dysentery, and scurvy are most obnoxious to it.

The proper remedies are sequestration of the patients, the free use of the nitric acid lotion, iodine to the inflamed skin, charcoal, port wine, or yeast cataplasm, and frequent ablution.
tions with disinfecting fluids, aided by opium, quinine, tincture of iron, lemon-juice, and other supporting means. Mopping the affected surface freely with strong nitric acid often answers an excellent purpose. The favorite remedy of Pouteau was the actual cautery.

9. *Pyemia*, the purulent infection of the French writers, is one of the chief dangers after severe wounds and operations. It was the great source of the mortality after amputations, especially secondary, during the war in the Crimea. It usually comes on within from three to eight days after the injury, and is nearly always fatal. Its characteristic symptoms are rigors, followed by copious sweats, rapid failure of the vital powers, delirium, and a withered appearance of the countenance, frequently conjoined with an icterode tinge of the eye and skin. On dissection, the large veins leading from the stump or wound are found filled with pus, with redness of the lining membrane; and abscesses, usually small and filled with unhealthy fluid, are seen scattered through the lungs, muscles, and cellular substance, matter also occasionally existing in the joints. The treatment is essentially the same as in crysipelas.

h. *Traumatic tetanus* is not very common in military practice. It is most liable to show itself in tropical countries, in hot, damp weather, and in persons of a nervous, irritable temperament, occasionally supervening upon the most insignificant injuries, as, for example, a mere scratch. In India the disease is often provoked by unextracted balls, and both in that country and on the continent of Europe the operation which was most frequently followed by it during the recent wars, was amputation at the shoulder-joint.

The effects of sudden vicissitudes of temperature in developing tetanus, are well known. They are most striking in tropical regions, when the change is from hot to cold, or from dry to wet. Larrey had repeated opportunities of observing the development of the disease under such circumstances, both in Egypt and Germany. After the battle of Bautzen, the exposure of the wounded to the cold night air produced over a hundred cases of tetanus, and a large number suffered from a similar cause after the battle of Dresden. Like effects were witnessed at Ferozepore and Chillianwallah. Baudens, in his treatise on gunshot wounds, states that the influence of cold and moisture in developing the disease, during the French campaigns in Africa, was most striking. Of forty slightly wounded men, placed in a gallery on the ground floor, during the prevalence of a northeasterly wind, fifteen were speedily attacked with tetanus. Similar effects have
several times been noticed in this country. Thus, after the battle of Ticonderoga, in 1758, nine of the wounded who were exposed the whole night after the action, in open boats upon Lake George, died of lock-jaw; and during our war with Great Britain, most of those who suffered on board the Amazon, in the engagement before Charleston, were attacked with this disease a fortnight after, in consequence of a very sudden change of weather, the wind blowing cold and wet.

The extremes of heat and cold both favor the production of tetanus. In the East and West Indies, the slightest prick of the finger or toe is often sufficient to induce the disease, and the inhabitants of the Arctic regions not unfrequently suffer in a similar manner. Dr. Kane, in his memorable expedition, lost two of his men from this affection, and he adds that all his dogs perished from a like cause.

The mortality from traumatic tetanus is notorious. Hardly one recovers. Nearly all perish in two or three days from the attack.

The most reliable remedies are opium, in the form of morphia or acetated tincture, in large doses, in union with camphor and antimony. The effects of Indian hemp are uncertain. Chloroform will mitigate pain and spasms. Amputation, except, perhaps, when the wound affects a finger or toe, will be worse than useless, as will also be counter-irritation along the spine. To prevent the disease should be our business, and to do this no wounded person should ever be exposed to the cold night air, or to currents of air at any time. After all amputations, however trifling, special directions should be given upon this point.

CHAPTER VIII.

INJURIES OF THE HEAD, CHEST, AND ABDOMEN.

The immediate effects of concussion of the brain are those of fainting or collapse, and must be treated accordingly; by recumbency, access of cold air, the use of the fan, dashing of cold water upon the face and chest, and sinapisms to the precordial region, thighs, feet, and spine, aided, in the more severe cases, by stimulating injections. If the patient can swallow, he may take a little wine or brandy. A smelling-bottle may be held near, not to, the nose. Reaction is not promoted too rapidly, for fear of secondary consequences.
The period of danger from collapse being over, the patient is sedulously watched, that overaction may not occur, the risk now being from inflammation; or, the stage of excitement being happily passed, from the remote effects of the injury. If the concussion was at all severe, all bodily and mental excitement must be for a long time avoided.

Compression of the brain arises, surgically speaking, from two causes only: effusion of blood and depressed bone. In the former case, the characteristic symptoms—insensibility and coma, dilated and fixed pupil, stertorous breathing, and paralysis—frequently do not come until some time after the receipt of the injury. The first symptoms will probably be those of concussion, or exhaustion. By-and-by the patient regains his strength, gets up, talks, or walks, and then suddenly drops down, as if he had been shot, in a state of utter unconsciousness. The effusion of blood, kept in abeyance during the collapse, has had full play, filling empty places, and causing unmistakable effects. Such an occurrence will be most apt to happen when there has been extensive separation of the dura mater, or rupture of the middle meningeal artery. If, on the other hand, the compression is due to depression of the skull, the symptoms are nearly always immediate.

When the case is one of sanguineous compression, it must be treated very much as one of ordinary apoplexy; at first, by efforts at gradual reaction, and afterward by purgatives, bleeding, and means to favor cerebral accommodation and prevent inflammation. The trephine is not thought of unless the unconsciousness obstinately persists, and there is reason to believe, from the nature of the phenomena, especially the existence of a wound or contusion on the head, that the blood may be reached by the instrument.

Gunshot injuries of the skull, with or without lodgment of the ball, may be productive merely of concussion of the brain, or of concussion and compression. When the missile penetrates the bone, and tears up the cerebral tissues and membranes, death usually occurs instantly, or within a short time after the receipt of the accident, without, perhaps, any attempt at reaction. Nevertheless, a number of cases of injury of this nature, in which the patient either partially or completely recovered, have been recorded by military surgeons. In some instances the ball merely penetrates the skull, with no apparent depression, and in this event the treatment should evidently be very simple, being limited,
in great degree, after the occurrence of reaction, to the prevention of inflammation of the brain. A similar course should be adopted when the bone is broken and only slightly depressed, especially if there be no urgent or obstinate symptoms of compression. When, on the contrary, the bone is badly fractured, comminuted, or forced greatly beyond the natural level, the proper plan is to trephine whether there be any external wound or evidences of compression or not. If the operation be neglected, loss of life from inflammation will be sure to arise within the first six or ten days after the receipt of the injury. In the punctured fracture, as it is named, the trephine is invariably employed at the earliest moment, however flattering, apparently, the head symptoms may be. If the instrument be withheld, fatal cerebritis or arachinitis will be no less certain than when the bone is shattered and driven down upon the brain.

Fracture of the skull by contre-coup, so common in civil practice, is seldom met with on the field of battle; doubtless for the reason that the injury is hardly ever inflicted upon the top or the base of the cranium, as it is when a person is struck upon the vertex or falls upon his nates. The most frequent fracture among soldiers is the punctured. A ball has been known to break the internal table of the skull without the external.

The skull is sometimes frightfully injured without any serious lesion of the scalp. Macleod refers to a case, which occurred at the Alma, where it was completely destroyed by a glancing shot, without any material implication of the soft parts. A round shot ("en ricochet") struck the scale from an officer's shoulder, and merely grazed his head as it ascended. The result was instant death. The skull was so completely mashed that its fragments rattled under its scalp as if loose in a bag. The condition of the brain was, unfortunately, not ascertained.

In the more simple forms of fractures of the skull, however induced, the practice of trephining is now much less common than formerly, and there is no doubt that the patient often makes a good recovery, though it is by no means certain that such a person may not suffer seriously, at a more or less remote period from epileptic and other affections. I am convinced from my own observation that this happens not unfrequently. Dr. Stromeyer, surgeon-in-chief in the Schleswig-Holstein campaign in 1849, expresses
strong opposition to the use of the trephine in gunshot and other fractures of the skull, even with depression, on the ground that, independently of the mischief inflicted in the operation upon the tissues, admission of air to the contused portion of the brain greatly augments the danger of inflammation. Of 41 cases of gunshot fractures of the skull with depression, reported by him, 34 were cured, and of these 1 only had been trephined.

When operative interference is deemed improper, the most simple treatment should be enforced. Any probing that may be necessary should, if practicable, be performed with the finger, and the wound should not be enlarged, except when we are compelled to elevate depressed or remove loose bone.

When trephining is required, it should be done as early as possible, and without chloroform or ether, unless the patient is very unruly, as the anaesthetic might tend to provoke inflammation of the brain. Every particle of depressed bone should be elevated, and such portions as are loose, detached, or driven into the brain, and easily accessible, removed. All bleeding vessels are tied, the edges of the wound are gently approximated with silversutures, and the head, well shaved and raised, wrapped in warm or cold water-dressing, as may be most grateful to part and system. The great danger after all severe injuries and operations upon the skull is inflammation of the brain and of its membranes, and to the prevention of this, therefore, the surgeon should direct his most zealous efforts. The patient must be frequently visited, and every untoward symptom promptly met by appropriate measures, of which active purgation, loss of blood by venesection, leeching or cupping, a restricted diet, and exclusion of light and noise from the apartment, with perfect rest, are the most reliable.

Wounds of the brain must be managed upon general principles; all foreign matter is at once removed, and the parts being restored as nearly as may be to their normal relations, the surgeon endeavors to keep the resulting inflammation within proper limits. Most of such lesions prove fatal within the first week from their receipt. If the patient survive for any length of time, death will generally come at last from exhaustion, cerebritis, or fungus.

 Portions of the skull, sliced off by the sabre or sword, should be replaced and secured by wire sutures, even if they are attached merely by small shreds of the scalp.
Scalp wounds of every description, but in particular the contused, lacerated, punctured, and gunshot, are extremely prone to be followed by erysipelas; death may also occur from cerebritis, arachnitis, and pyemia. The slightest lesion, then, of this region of the body should be zealously watched.

Wounds of the face must be treated with an eye to the avoidance of disfiguring scars, by wire sutures and cold water-dressing. When a large portion of the lower jaw is shot away, the tongue will be apt to fall back upon the glottis, causing suffocation. The organ should be drawn forward with the finger or tenaculum, and the patient observe the prone position until the tendency is lost.

One of the great sources of annoyance and danger, in gunshot wounds of the face, is secondary hemorrhage. It frequently appears soon after the accident, and, although it often ceases spontaneously, it is sometimes controlled with much difficulty. Paralysis, partial or complete, is not uncommon, owing to injury of the branches of the facial nerve.

In the management of wounds about the mouth, throat, and face, great care must be taken not to allow the offensive mucous and salivary secretions to pass into the stomach. The neglect of this precaution is apt to be followed by a low typhoid state of the system, very similar to what occurs in pyemia, or blood poisoning. I have repeatedly witnessed these effects after operations upon the jaws, mouth, and even the nose.

In fractures of the bones of the face from gunshot an exception should be made to the general rule of removing fragments which are nearly detached, observation having shown, says Mr. Macleod, that the large supply of blood in this region will enable them to resume their connection with the other tissues, in a way that would be fatal to similarly placed portions in other situations.

Gunshot and other wounds of the chest are, as stated elsewhere, extremely fatal; death, if the lesion be at all severe, being usually speedily caused by shock, hemorrhage, or asphyxia; or, at a more or less remote period, by inflammation and effusion. When the lungs are wounded, the characteristic symptoms will be hemoptysis, with suffocative cough, great prostration, and excessive alarm. A copious flow of blood may take place in the thoracic cavity from a wound of one of the intercostal arteries.
Any foreign matter that is easily accessible is at once removed, but officious probing is out of the question. The wound, if small and unaccompanied by serious hemorrhage, is closed in the usual manner, the chest being firmly encircled by a broad bandage, to compel diaphragmatic respiration. Under opposite circumstances, it is kept open, the patient lying upon the affected side to favor the escape of blood with as much elevation of the head as the case may admit of. The main reliance for arresting pulmonary bleeding is upon venesection, copious, and frequently repeated, unless the exhaustion amounts to absolute collapse. Sugar of lead, opium, and veratrum viride are frequently exhibited, sinapisms are applied to the extremities, and, in short, everything is done to control cardiac action. Inflammatory symptoms are counteracted in the usual manner, and effused fluids, causing oppression, and resisting ordinary measures, are, unhesitatingly, evacuated by puncture, as the only chance of escape.

Wounds of the heart and aorta, of whatever nature, are usually fatal; now and then, however, an astonishing exception occurs.

Wounds of the abdomen, merely penetrating its walls, but not its contents, are brought together by sutures, extending down nearly to the peritoneum, otherwise they will be followed by hernia. When they involve the intestine, and are incised, they are sewed up with a fine needle and silk thread, either interruptedly or continuously, the ends of the ligature being cut off close.

Contusions of the walls of the abdomen by round shot are among the most dangerous injuries to which the body is exposed, often rupturing both the hollow and solid viscera, and rapidly causing death, without much apparent sign of so severe an accident. The most important symptoms of these contusions are vomiting, and pain in the abdomen; and the great object of the treatment, in the event the patient survives their immediate effects, is the prevention of peritonitis, which often comes on in the most stealthy manner. Laceration of an internal organ is nearly always promptly fatal. Shell wounds of the walls of the abdomen are generally followed by extensive sloughing. Abscesses among the muscles of the abdomen are not uncommon after gunshot injuries.

Balls often traverse the walls of the abdomen for a considerable distance without entering its cavity, or they pass in without injuring any of the contained viscera.
"The fatality of penetrating wounds of the belly," observes Macleod, "will depend much on the point of their infliction. Balls entering the liver, kidneys, or spleen are well known to be usually mortal, although exceptional cases are not rare. Wounds of the great gut are also always recognized as much less formidable than those which implicate the small. Thomson saw only two cases of wounds of the small gut, after Waterloo, in the way of recovery; but Larrey reports several. Gunshot wounds of the stomach are also exceedingly fatal. Baudens records a remarkable case of recovery, although complicated with severe head injuries. The syncope which followed the severe hemorrhage in this case lasted for ten hours, and doubtless assisted along with the empty state of the stomach at the moment of injury, in preventing a fatal issue."

Gunshot wounds of the bladder occasionally occur; the ball may penetrate the organ in any direction, and at the same time commit extensive havoc in the neighboring parts, both soft and osseous. Such lesions are generally fatal. Simple gunshot wounds, on the contrary, are sometimes recovered from, especially when they are treated by the retention of the catheter, thus allowing the urine to flow off as fast as it descends from the kidneys. The operation of laying open the wounded viscus through the perineum, as originally proposed by Dr. Walker, of Massachusetts, might be performed in such a contingency. Such a procedure would be much more likely to prevent urinary infiltration than the catheter, however carefully retained, during the detachment of the sloughs, as well as before the contiguous structures have been glazed with lymph.

Balls, pieces of cloth, fragments of bone, and other foreign bodies, if retained in the bladder, generally serve as nuclei calculi, and should, therefore, be as speedily extracted as possible, either through the perineum, or by means of the forceps or lithotriptor. Quite a number of cases, in which the operation of lithotomy was successfully performed for the purpose of effecting the riddance of balls and other extraneous substances, have been reported by different writers, as Morand, Larrey, Baudens, Langenbeck, Guthrie, and Hutin.

CHAPTER IX.
DISEASES INCIDENT TO TROOPS.

The diseases which attend armies, or molest soldiers in camps, garrisons, and hospitals, and which so often deci-
mate their ranks, and even, at times, almost annihilate whole regiments, are the different kinds of fevers, especially typhus and typhoid, dysentery, diarrhoea, and scurvy. These are, emphatically, the enemies of military life, doing infinitely more execution than all the weapons of war, however adroitly or efficiently wielded, put together. Pneumonia, pleurisy, and hepatitis, of course, slay their thousands, and various epidemics, especially cholera, not unfrequently commit the most frightful ravages. "War," says Johnson, "has means of destruction more formidable than the cannon and the sword. Of the thousands and tens of thousands that have perished, how small a proportion ever felt the stroke of an enemy!" Frederick the Great used to say that fever cost him more men than seven pitched battles, and it has long been a matter of history that more campaigns are decided by sickness than by the sword. The great mortality which attended our armies in Mexico was occasioned, not by wounds received in battle, but by the diseases incident to men carrying on their military operations in an inhospitable climate, badly fed, subjected to fatiguing marches, and obliged to use unwholesome water. Thousands perished, during their absence, from fever, dysentery, and diarrhoea, and a still greater number from the effects of these diseases, after the return of the troops to their native soil. The latter affection, in particular, pursued many, like a relentless foe, to their graves long after they had been cheered by the sight of their homes and friends.

In the war in the Crimea disease destroyed incomparably more soldiers than the sword, the musket, and the cannon. Typhus and typhoid fever, dysentery, diarrhoea, scurvy, and, lastly, malignant cholera, annihilated vast numbers, both in the British, French, and Russian ranks. According to Dr. Macleod, whose "Notes on the Surgery of the War in the Crimea," are so well known to the profession, the proportion of those lost among the British by sickness to those lost by gunshot and other injuries, was, during the entire campaign, as 16,211 to 1761, exclusive of those killed in action. The difference he supposed to have been still greater among the French and Russian forces. In December, 1854, and in January, 1855, not less than 14,000 French soldiers were admitted into the Crimean ambulances on account of disease, whereas, during the same period, only 1500 were admitted on account of wounds. Of the whole number nearly 2000 died. During the last six months of
the campaign, in which the city was stormed and taken, the French had 21,957 wounded as an offset against 101,128 cases of Disease.* At Walcheren, in 1809, the British lost one-third of their troops by disease, and only 16 per cent. by wounds. In the Peninsular war, from January, 1811, to May, 1814, out of an effective force of 61,500 men only 42.4 per 1000, says Macleod, were lost by wounds, while 118.6 were lost by disease.

The number of sick that may be expected to be constantly on hand during any given campaign is estimated, on an average, at 10 per cent.; but this proportion must necessarily be exceeded, especially in an invading army, with raw, undisciplined, and unacclimated troops. This was eminently true even in the Crimea, in a climate comparatively healthy, within a few miles of the sea. We may well imagine what would be the effects of the climate of the South upon the Northern troops, if they were to pass far, during the hot season, beyond Mason and Dixon's line. Disease in its worst form, would be sure to invade and thin their ranks at every step. Fever—typhoid, typhous, remittent, intermittent, and yellow—dysentery, diarrhoea, scurvy, pneumonia, and inflammation of the liver would accomplish more, infinitely more, for the Southern cause than all the weapons of war that could be placed in the hands of the Southern people. Typhoid, typhus, and yellow fever, dysentery, diarrhoea, and scurvy would, in all human probability, soon become epidemic, and occasion a mortality truly appalling. The Southern soldier, on the contrary, thoroughly acclimated as he is, would suffer comparatively little. The British in the Crimean war lost 5,910 men from diarrhoea and dysentery, the whole number of cases having been 52,442, affording thus a mortality of 11.26 per cent. Cholera, of which there were 7,575 cases altogether, destroyed 4,513 or in the ratio of 59.57 per cent. Typhus fever killed 285 out of 828 cases; fever not typhus, 3,161, out of 30,376. The French and Russian troops suffered in still larger numbers from these diseases. Macleod asserts that the former lost their men by typhus fever by thousands, and the latter by tens of thousands. The British suffered but little from intermittent fever, whereas this disease did

* Macleod, op. cit., p. 67.
great mischief among the French, causing serious mortality, either directly or indirectly, besides disqualifying large numbers for service.

Scurvy was another dreadful enemy which the British and French troops were compelled to encounter in the Crimea. It prevailed more or less extensively for a long time and served to impart its livery to the other diseases of the soldiery, masking their character, and remarkably augmenting their virulence.

Considering, then, the frequency of the occurrence of these diseases, and their excessive fatality, it behooves the military surgeon to use every means in his power to guard, in the first place, against their outbreak, by the employment of proper hygienic or sanitary measures, and in the next, to treat them with all possible diligence and judgment when their development is unavoidable. It is, of course, impossible, in a work of this description, to enter into any details upon the subject; but there are several points which cannot, I conceive, be too forcibly impressed upon the mind of the military practitioner. I refer to the great, the paramount importance of—1st, proper isolation of the sick, or, what is the same thing, the importance of not crowding them together; 2dly, free ventilation; 3dly, bodily cleanliness; 4thly, little medicine; 5thly, a good supply of fresh vegetables and fruits, especially oranges and lemons; 6thly, careful and tender nursing.

Painful experience has shown in all parts of the world, that the crowding together of the sick and wounded is one of the worst calamities that can befall them. For want of this precaution, diseases, otherwise easily manageable, often assume an epidemic character, or, in the absence of this character, often baffle the best directed efforts for their relief. When the wounded are crowded together they frequently become the victims of erysipelas, hospital gangrene, pyemia, and phlebitis; occurrences which, under better regulations, might in many cases be entirely prevented.

Of the propriety of constant and thorough ventilation, it is unnecessary to speak. If pure air is so essential in health, it is easy enough to see how important it must be in sickness.

Cleanliness of body should be regarded as a religious duty; it may be effected with the sponge and tepid, cool or cold water, according to the exigencies of the case, and can-
not be performed too frequently or too thoroughly, care being, of course, taken not to worry or fatigue the patient. In some instances the water may be medicated with common salt, potassa, vinegar, or Labarraqe's solution. Nothing is generally more grateful to the sufferer, in the different kinds of fevers, than frequent sponging of the surface with cool or tepid water.

The use of heroic medicines, or of any medicines in large doses, in these diseases, and also in cases of severe wounds, cannot be too severely reprobated. More men, there is reason to believe, have been killed in this manner in the armies and navies of the world than by the sword and the cannon. Let medicines, then, be administered sparingly. Let the secretions be well seen to; but purge little, and use depressants with all possible weariness. Give iced water but not too freely, and lumps of ice when there is much thirst with gastric irritability and excessive restlessness. Mild diaphoretics and anodynes, will, as a general rule, be highly efficacious, but the latter should be exhibited with great caution when there is cerebral oppression. Lemon-juice and potassa are indispensable in scurvy, or where there is a marked tendency to scorbutic disease. Quinine is one of the great remedies in most, if not in all, of these diseases, especially when, as is so often the case, they are associated with a malarious origin. The good average dose is from two to five grains, repeated from three to five times in the twenty-four hours. When marked debility prevails, the best stimulants are brandy, in the form of milk-punch or toddy, and Madeira, Port, or Sherry wine.

Immense suffering and loss of life are often occasioned for the want of fresh vegetables and fruits in military operations, as well as in the garrison and the hospital. A daily supply of these articles should, therefore, be provided at almost any hazard and expense. In all low states of the system, however induced, the strength can never be rapidly brought up without a diet which partakes more or less of this character.

There is a form of dysentery, very common in India, which is exceedingly apt, when large masses of troops are habitually congregated together, to assume an epidemic character; and it is for this reason that it has often been supposed to be contagious. For such an opinion, however, there does not seem to be any valid reason. Ballingall,
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who witnessed at least 2000 cases of this disease, asserts that he never once met with a circumstance tending to create such a suspicion; and the views advanced by this eminent surgeon are those now pretty generally, if not universally, entertained by the British practitioners in India.

"The remote causes of dysentery in India are conceived to be heat, particularly when combined with moisture; the immediate and indiscriminate use of fruits; the abuse of spirituous liquors, and exposure to currents of wind and to noxious night-dews." Troops recently arrived from Europe are particularly prone to the disease.

Tropical dysentery presents itself in two varieties or form, the acute and the chronic. The first, which is an extremely fatal disease, is seated in the rectum and colon, the latter being often involved through nearly its entire extent, and it frequently commits very serious, if not irreparable, mischief in these structures before the patient and the attendant are aware of its true character, owing to the absence of urgent pain and pyrexia. In general the attack is ushered in by the ordinary symptoms of diarrrhoea, such as gripping pain in the bowels and frequent calls to stool with excessive straining, the evacuations being, at first, thin and copious but without fetor and but little streaked with blood. The tongue, skin, and pulse are nearly, perhaps entirely normal. Gradually the pain becomes more violent, as well as more fixed, and is felt in both iliac regions, or even along the whole track of the colon; the discharges consists chiefly of blood and mucus, or of a fluid resembling water in which fresh beef has been macerated; the tongue is covered with a white coat; the skin is either hot and dry, or bathed with clammy perspiration; and the straining is so excessive as to occasion prolapsus of the rectum. The pulse is, even at this stage, often but little affected, being perhaps, only somewhat increased in quickness. Sometimes, however, it is very full, bounding, and vibratory, without much velocity, and when this is the case it always, according to Ballingall, forebodes evil. Toward the close of the attack, the passages are frequently involuntary and intolerably fetid, gangrenous portions of the mucous coat of the bowel are sometimes extruded, and the surface of the body emits a peculiar cadaverous smell. The average period at which death occurs is about one week, but many cases linger on much longer.
The remedies upon which the India practitioners mainly rely in the treatment of this horrible form of dysentery are venesection, mercury, and opium, leeches, purgatives, diaphoretics, warm bathing, blisters, and enemata, being employed as auxiliaries. Venesection is always practiced early, and, even when the patient is not very robust, boldly, it being, apparently, regarded as the sheet anchor of the physician’s hope. Calomel is administered in doses of from ten to twenty grains, along with two or three grains of opium, twice or thrice in the twenty-four hours; and, while profuse salivation is discountenanced, production of slight ptymalism is generally aimed at.

Such treatment as this seems altogether frightful to the modern American practitioner; it strikes him as unnecessarily harsh, and as well calculated to augment the mortality of the disease. We might, in this country, perhaps bleed, and that pretty freely, at the very commencement of an attack of dysentery; at all events, leech very copiously, but we would certainly draw blood sparingly if the attack had already made serious constitutional inroads, or if it was of an epidemic character, and, as to giving mercury with a view to ptymalism, however slight, few men would, I presume, be so fool-hardy. The India practitioners do not, it appears, employ quinine in the treatment of this form of dysentery; a remedy so extremely needful in many cases of this disease as it prevails in this country, especially in our Southern latitudes, where it is not unfrequently of a malarious origin.

The chronic form of India dysentery, termed hepatic flux, more frequently attacks persons who have been for some time inured to the climate of that country, and is always associated with biliary derangement. “This flux, like the other, often assumes at its commencement the appearance of a common diarrhoea, and becomes afterward characterized by frequent and severe fits of griping, resembling colic pains, particular urgent about the umbilical region. Each attack of griping is generally succeeded by a call to stool, and the evacuations are always unnatural in color and consistence, free from any admixture of blood, but generally of a yeasty or frothy appearance, and accompanied with large discharges of flatus; while in passing they are attended with a sense of scalding about the anus. The patient, after each evacuation, feels considerably relieved, and hopes to enjoy an interval of ease, but the recurrence of the
griping, accompanied with a sensation of air passing through
the bowels, and succeeded again by a call to stool, give him
little respite. From the commencement of the attack, the
patient complains of nausea, want of relish for his food,
and preternatural thirst, attended often with a disagreeable
taste in the mouth. The tongue is furred or loaded, and
not unfrequently covered with a yellow bilious coat. The
pulse is quickened and the skin parched.*

Cholera morbus must, necessarily, in this country, especially
in our Southern latitudes, and during the hot summer
months, be a more or less frequent attendant upon camp
life, although much may be done, by a proper observance of
hygienic laws, to prevent it. When the disease breaks out
it cannot be arrested too speedily. The most appropriate
remedies, particularly in its earlier stages, are perfect qui-
tude, abstinence from drink, sinapisms to the epigastrium,
and an efficient dose of morphia and camphor, or even mor-
phia alone. If torpor of the liver exists, blue mass or a
few grains of calomel may be advantageously combined
with the anodyne. The swallowing of small lumps of ice
will greatly assist in allaying the gastric irritability. A
mustard and salt emetic will be indicated if the stomach is
loaded with ingesta. The bowels are quieted with an ano-
dyne enema; and to relieve thirst, and reduce heat of skin,
the surface is frequently sponged with cool or tepid water.
A combination of carbonate of potassa and acetated tinc-
ture of opium, with fresh lemon-juice, in peppermint or
camphor water, will often act like a charm in relieving the
gastric and intestinal irritability, the cramps, and other dis-
tressing symptoms.

The exposure of the soldier, both in the tent and on the
field, renders him extremely prone to rheumatism, frequent-
ly attended with high inflammatory excitement and severe
pain. Such an attack is often effectually put to flight if, at
its inception, it be treated with a large anodyne and dia-pho-
retic mixture, as fifteen grains of Dover’s powder, a third
to half a grain of sulphate of morphi with a fourth of a
gram of tartar emetic, or, what is perhaps still better, a
draehm of the wine of colchicum in union with a full dose
of morphia or black drop. When the disease has already
made some progress, an active purgative should precede the
exhibition of these medicines,

*Ballingall’s Military Surgery, p. 511, 1844.
Sore throat, tonsilitis, and catarrhal affections, or, what in common language are called colds, are very common among soldiers, especially the raw troops just mustered into service, ill clothed, inexperienced, and unaccustomed to camp life. The moment such disease sets in, no matter how light it may be, the person should be compelled to report himself at the surgeon's quarters, in order that he may receive the necessary attention and advice. Generally an attack of this kind will promptly yield to a trifling prescription, as a little hot drink, a mild aperient, or, better still, a quarter of a grain of morphia, a grain of opium, or a large dose of Dover's powder.

In an army not under strict discipline, or where proper care is not observed in enlisting, mania a potu is very apt to show itself, much to the annoyance of the nurses and the physicians. If, in such a case, the patient be not well secured, he may, in his perverted military ardor, do serious mischief to himself and to his attendants. A moderately active mercurial purge at the outset of the disease will often go far in quieting the system and in abridging the attack. After the medicine has operated, a mild opiate and sedative treatment will generally be the most soothing. Alcoholic stimulants are, in general, to be withheld.

Nostalgia is another complaint liable to assail the soldier, even the hardiest, especially if he is a person of strong domestic attachments, or engaged in an "affaire du cœur." It is more apt to show itself in soldiers enlisting for the foreign service, or in those who are forcibly expatriated, and is often attended with great suffering, terminating in confirmed melancholy. It is characterized by a love of solitude, a vacant, stultified expression of the countenance, a morose, peevish disposition, absence of mind, pallor of the cheeks, and progressive emaciation. Many of Bonaparte's troops, during the campaign in Egypt, suffered from this complaint; some in a very distressing degree. In this country, nostalgia will not be likely to occur, at least not to any extent, as our people are essentially of a roving habit, and of an eminently social disposition. The treatment is rather moral than medical; agreeable amusements, kindness, gentle but incessant occupation, and the promise of an early return to home and friends constituting the most important means of relief.

It is impossible, even under the most rigid discipline, to prevent gonorrhoea among soldiers. They will expose them-
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solves, in spite of all that can be done to prevent it, and they often pay a heavy penalty for their indulgence, not only from the suffering entailed by the primary disease, but its different complications, especially chordee, cystitis, and orchitis. The symptoms of gonorrhea are too well understood to require enumeration here. The treatment should, from the start, be rigidly antiphlogistic; by rest, low diet, active purgation, and the antimonial and saline mixture, with the addition of a small quantity of copaiba. The penis and scrotum are well supported, and covered with warm water-dressing, the former organ being bathed in tepid salt water, at least thrice daily, for twenty minutes at a time. When the discharge is greatly lessened, but not till then, recourse is had to injections of lead, sulphate of zinc, or nitrate of silver, at first very mild and gradually increased in strength, repeated every six, eight or twelve hours. The treatment is continued, in a modified form, for about five days after all the specific symptoms have vanished.

Chordee is best relieved by a full anodyne, as half a grain of morphia, in union with the fourth of a grain of tartar emetic, given toward bedtime, or by a large enema of laudanum; with warm water-dressings to the genitals.

For the relief of cystitis the most appropriate remedies are anodyne diaphoretics, in the form of Dover's powder, or a solution of morphia and tartar emetic, aided by the free use of bicarbonate of soda and moderate quantities of diluents.

Orchitis is treated by suspension of the affected organ, with strong lead and anodyne lotions, and the judicious exhibition of antimony, in union with morphia or black drop.

Chancre must be thoroughly cauterized at the beginning, either with nitrate of silver, nitric acid, or acid nitrate of mercury; and subsequently, or after the disease has made some progress, like any common sore, with mild measures; mercury being studiously withheld, except in the hard form of the disease, but not even then while there is much inflammation or inordinate constitutional excitement. In a word, all harsh measures must be avoided. The patient will generally do a thousand times better without than with mercury. The greatest possible attention must be paid to cleanliness, and for this purpose the parts should be frequently bathed in tepid salt water, aided by the syringe if there be a tight prepuce. The best local application is the
warm water-dressing, covering in the entire genitals; if much swelling and pain are present, it may be advantageously medicated with lead and opium. As the inflammation subsides, the sore may be dressed with some gently stimulating lotion, as two grains of tannin, the eighth of a grain of sulphate of copper, and half a drachm of laudanum to the ounce of water, a weak mixture of sherry and water, or a solution of nitrate of silver, zinc or iodide of iron. If the ulcer is disposed to spread, or presents a sloughy or unhealthy aspect, it will be proper to touch it lightly twice a day with the solid nitrate of silver, or a solution of one part of acid nitrate of mercury to four parts of water.

The constitutional treatment is rigidly antiphlogistic, or tonic and supporting, according to the particular nature of the case. The bowels should receive early attention; the skin be kept moist; and pain be allayed by anodynes. Perfect recumbency should be observed until the parts are nearly healed. If mercury be required, the best forms will be calomel and blue mass, in small doses twice a day, with a vigilant eye to their effects, ptyalism being studiously avoided in every case.

If bubo supervene, the treatment must be prompt and efficient, with a view to the prevention of further mischief. Recumbency, the topical use of iodine with warm water-dressing medicated with lead and opium, light diet, and the antimonial and saline mixture constitute the most appropriate measures. If matter form, an early and free incision is made, and the part afterward treated as a common sore, the granulating process being promoted by mild means. Mercury is carefully withheld, at all events in the early stage of the disease.

The army is no place for soldiers laboring under secondary or tertiary syphilis; the sooner they are dismissed from the service the better, especially if they are volunteers.

Ophthalmia is one of the annoyances of the soldier's life. Liable to be caused by cold, it is capable of assuming several varieties of form, and sometimes prevails extensively as an epidemic. The granular and purulent, in particular, are to be feared, as they frequently destroy the sight, and even the eye, in a few days, occasioning intense suffering. To ascertain the condition of the parts, the lids must always be gently everted with a probe or the finger. The greatest cleanliness should be observed in these affections; the patients should, if possible, be sequestered, at all events not
be permitted to use the same basins and towels; the light should be excluded from the apartment; and the general and local treatment should either be strictly antiphlogistic or of a mixed character, partly antiphlogistic and partly stimulant. The applications should be of the mildest description, especially those intended for the inflamed surface. The syringe is frequently used to wash away the secretions. Strong collyria generally do immense harm in all forms and stages of ophthalmia. Blood may be taken from the arm, or by cups or leeches from the temples, if the symptoms are unusually urgent and the patient plethoric. In rheumatic inflammation of the eye, colchicum and morphia, given freely at bedtime, will be of immense service.

When foreign matter gets into the eye, or becomes imbedded in the cornea, speedy removal must be effected, and the parts afterward treated with rest, cold or tepid bathing, gentle aperients, and seclusion from light. Particles of steel and other sharp bodies are picked out with the point of a delicate bistoury, or cataract needle. The effects of lime and other alkalies are neutralized by syringing the eye freely with a weak solution of vinegar; those of nitrate of silver, with a weak solution of common salt, a thorough coating of olive oil being afterward applied.

Carbuncles, boils, and abscesses, which are of frequent occurrence in army practice, demand prompt attention, both on account of the suffering they induce and the disqualification they may entail for temporary duty. They should be opened early and freely, and no time be lost in amending the general health by gentle mercurial and other purgatives, alterants, and tonics, particularly quinine and iron. The most appropriate topical remedies are tincture of iodine and warm water-dressings.

In carbuncles the affected structures, after free division, will generally require the thorough application of some escharotic or detergent stimulant, as Vienna paste, nitric acid, nitrate of silver, or acid nitrate of mercury.

Continued in August Number.
Health in the Camp. By Paul F. Eve, M.D., Nashville, Tenn.

The science of medicine has an intimate connection with the movements of armies and navies, and in all civilized nations is an important element in their organization. As surgeons and physicians, our peculiar province is to mitigate the sufferings incident to warfare by stanching the bleeding, binding up the wounded, relieving pain, preventing disease, healing the sick. The high office of our noble calling is to cure the millions, who for want of timely care, would die of medicable wounds and remedial affections.

In all well regulated armies and navies, each detachment or separate command and each vessel, however small, is entitled to have a medical officer. Four or five companies, each of from fifty to one hundred men, compose a battalion, and two of these constitute a regiment. Each battalion has its medical officer, so that in a regiment there are two, known as the surgeon and the assistant surgeon, who are also called the regimental surgeons. It is a part of their duty to enter into battle with their battalions, so that all soldiers slightly wounded may at once be attended to, and that thus the combatants may not be reduced in the ranks during an engagement. Two or more regiments form a brigade commanded by a brigadier-general, and two or more brigades a division, whose commander has the title of major-general. Now each general appoints in his staff his surgeon or surgeons, to whom are committed the arrangement of hospitals for the sick, and ambulances for those severely wounded on the field. These constitute the staff surgeons whose position is usually in the rear of the line of battle where capital operations, &c., may be safely performed. There are men enlisted as stewards and nurses for the special purpose, in order that while the wounded may be properly cared for, at the same time, nothing, not even the calls of humanity, may interrupt the conflict carried on by the contending forces.

In the army of the United States as the wars have been few and no large assemblage of troops been required, the appointment of medical officers has been restricted to regimental surgeons, and in it there are no staff surgeons. The senior medical officer of a division or of an independent command of a general sometimes has the the title of medical inspector or director; and of a commodore's command at
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sea, that of fleet surgeon. The highest medical officer known in our service is the surgeon-general, who, as the medical purveyor, &c., has the entire direction of this department in the army. A requisition for medicines, lint, bandages, or other materials for any number of men, a battalion, or division, is at once supplied by him. The acting surgeon-general of the Confederate army said to me in Richmond, a few days ago, he had purchased 4000 ounces of quinine at $2 25, and could get as much more at $2 50: and that now so systematized is the service, all he required in forwarding supplies to any given point, was the number of troops to be stationed there.

In the organization of the volunteer forces in the separate States, that of the regular army is assumed as the model. To insure well qualified medical officers, a board of examiners is established to assemble once a year for a few weeks, before which all applicants must undergo a rigid examination to obtain an appointment. Tennessee, however, has three surgeon-generals, besides a medical purveyor, who is also a full surgeon; and they, I understand, act as the medical board, which was no doubt designed to be created by her legislature.

The word surgeon is exclusively employed in the army and navy medical appointments, because it implies the highest qualifications for the discharge of professional duties: for no one can be a good surgeon who is not capable of making a good physician, but one may be a good physician and yet never become a surgeon at all.

Hygiene in the tented field, or the preservation of health in the military is just now a subject of deep interest to our people. To array his forces in the best possible physical condition is the grand object of every commander; and to do this he has to consult, and must rely chiefly upon his medical advisers. The prevention of diseases is the highest aim, the great design and end of medical science. We may not cure,—cannot under certain circumstances and in many cases, but from a knowledge of the causes producing human suffering, do certainly often control their effects. To indicate, however imperfectly, how health may be preserved and sickness prevented while exposed in the camp, and undergoing a great change of habits and mode of living, is the object of this article. It may do the recruit some good to make known those things, the observance or avoidance of which may best prepare him to perform his arduous
duties: and the maintenance of health and strength is now the more necessary since in carrying on modern warfare greater bodily activity is required than formerly. The Zouave drill demands greater personal vigor, more rapid movement and quicker evolution on the part of troops than ever exhibited before. Battles are now decided by rifle cannon and musket at long range, and then with the rush of the bayonet. Our armies should therefore not only be well equipped, but every man in them fully able to handle his weapon in the most efficient manner, and each one kept constantly vigilant and active.

Age.—The first remark I make in regard to the physical condition of the soldier is in reference to his age. To be prepared to endure the fatigue and exposure of a campaign, the human system should be fully developed. Males are liable to military duty from eighteen to forty-five years of age; but no one under twenty-one, the period of maturity, ought to be required to do full duty. The best soldiers Napoleon ever had were those drilled two years at Boulogne in 1805. The youngest among them was twenty-two, and when suddenly ordered to Austria, they traversed a distance of over a thousand miles without scarcely leaving a sick man on the route; but when in 1809, this great captain led his army again to Vienna from Strasburg, the nearest point from France, his young conscripts of twenty years filled numerous hospitals by the way. For the élan, a desperate reckless charge, or the forlorn hope, the young unmarried man, as he has fewer cares and everything to gain might be best; but for the regular service, the steady, continuous hard work in the line, those between twenty-five and forty will be found the most efficient. The life of a soldier and sailor is undoubtedly the most trying to the constitution of man, and no one ought to enter upon it before attaining a suitable age to sustain the hardship.

Habits.—These of course ought to be regular and systematic, and nothing indulged in to impair the full vigor of the constitution or prevent the perfect development of the system. Early hours are best that sleep may be obtained at night. The instinct of nature in this respect is no doubt right, approved as it is by reason and experience, that night is the proper time for rest. To recover from the fatigue of the day, for the system to recuperate from hard labor or a long march, the soldier requires at least eight hours repose. I know it is published, that Pichegru, one of the republican
generals of France, passed through a campaign with only one hours sleep in the twenty-four, and that Napoleon slept but four or five hours: these were, however, extraordinary instances. Gen. Taylor at the council of war held by the field officers after the battle of Palo Alto, made one general reply to the many anxious inquiries what was to be done, which was *let the men sleep*. The result at Resaca on the morrow plainly demonstrated how he estimated the value of rest to the weary soldier. To preserve health in the camp plenty of sleep is required; and the opposite to this; all irregular hours, sitting up late, excursions or exposures during the night; wet, uncomfortable places of repose are obnoxious, and should be carefully avoided.

Dr. Winship, who lifts eleven hundred pounds, says one condition to exert this immense power is plenty of sleep. After the treaty of Tilsit, the French Emperor, who, we have stated, was always so very wakeful, slept nine consecutive hours. It is not rest or repose alone, but to be refreshing it must be quiet, undisturbed sleep.

Great cleanliness is essential to the preservation of health at all times and particularly in crowded collections of men. Daily ablution of the whole person, when at all convenient, and throughout the year, is recommended. This greatly fortifies the system and enables it to resist the impression of cold, &c. The best time to bathe is in the morning, rising from bed, or before dinner; and where water is not abundant, a wetted sponge or towel freely applied to the body, followed by friction, may be substituted. After great fatigue or exposure the warm bath or bathing the feet in warm water is best.

The nails, hair and beard, it scarcely need be observed, so obvious are the reasons, ought to be worn quite short on the tented field.

Habit may become second nature, so that man can accus- toms himself to almost anything. The human will too is almost omnipotent. The veriest poisons may not only be daily used but even enjoyed as luxuries. I feel this is not the time or place to offer arguments against the use of ardent spirits and tobacco, or to attempt to classify them with opium and arsenic in their effects upon man; still the almost universal and incessant practice of drinking, chewing and smoking is unqualifiedly condemned. Whatever is injurious to the system, or weakens the power of its resistance to disease, ought to be abandoned; hence daily
rations of brandy or whiskey are no longer issued in the army or navy, but very wisely coffee and tea substituted instead. Chemistry in the nineteenth century has obtained two essential elements extracted from coffee and tea, known as caffeine and theine, having a remarkable affinity for the human system; thus confirming or legalizing as it were by science these excellent beverages which had been employed extensively for the three previous centuries. But the constituent principle from tobacco, nicotine, is a deadly poison; so that the sickness produced in first using it, the habitual furred tongue, lætid breath, tremor of muscles, nervousness, &c., in all those who smoke or chew, but ratify the truth revealed by the chemical analysis of it. The recent demonstrations too in a school in France is mathematical proof that the use of this article does obtund intellect and diminishes the vigor of young persons. While I would not curtail one comfort from the very small number enjoyed by the soldier in the toil and privation of a campaign, but would most willingly add to his pleasures and happiness; yet as a medical man I must denounce the constant habit of smoking and chewing, as I do that of drinking, because it renders him more liable to sickness, and when sick makes him more difficult to be recovered. And I know full well how such an unpalatable truth, for truth it is, will be received and how little heeded. I have but done a duty in pointing out how health may be secured by raising a warning voice, especially to the rising generation, against a fashionable habit injurious to the constitution of man, physically, mentally and morally. I would substitute coffee for the tobacco offered by your general in a recent order, and should not value the advice of your surgeon if found interested in a practice so unprofessional.

Diet.—The food of the soldier should be of the best material and properly prepared for easy digestion. To prevent exhaustion from the great and constant waste going on in the system the supply ought to be good and abundant. The commissary department is one of the most important. Troops to fight well must be fully provided and cared for, well fed, and well clothed. Without doubt the best organized army in the world, in all its appointments, is that of France. The French soldier has soup twice a day with vegetables and bread, besides his coffee. I believe that it is no caricature to say that ours are fed almost exclusively upon very fat bacon, poorly cooked bread and strong coffee, three times a day. With the
very best materials on the earth, yet in no country is the preparation for the table so lamentably deficient. Our mothers who did know how to cook are fast passing away; and alas! the art is now ignored, and we are rapidly becoming a nation of dyspeptics. The coffee drank in the camp is too strong, too much fat bacon is consumed, and the bread is not well baked. No work should be done on an empty stomach; the breakfast may be made to consist of coffee or tea largely diluted, if possible, with milk, a little meat, fresh if obtainable, and bread made of unbolted flour, or corn or rye meal. We have sacrificed the best properties of the wheat in its fineness and whiteness. The ancient Greeks and Romans, those renowned warriors, used no bolting cloths. Soup, whenever practicable, or stews with vegetables, some meat, bread, and no coffee for dinner; and for supper a light meal with tea, are best. Ripe fruits and vegetables in season, dried fruit cooked, eggs, butter, sugar, molasses, vinegar, &c., are all promotive of health, and are by no means to be omitted in the supply for the camp.

Clothing.—We live in a climate of great variability at all seasons, and it becomes us to guard against the frequent, great and sudden changes. Flannel next the skin at all times, when it can be endured, should be worn. Silk or cotton is preferable to linen for this purpose. I can recommend the flannel belt, particularly during the spring and summer months, as a preventive to bowel affections. The military cap is unsuitable to the Southern States; ought to be rejected entirely for the warm weather, and the broad brim hat worn during this period of the year. So too in regard to high collars, padded coats, stiff stocks, and tight clothes; a soldier or an officer on the battle field has no use for brass buttons, gold lace, cocked hats, corded tassels or epaulettes. While I admit a uniform is proper in all military men, I would have it exceedingly plain, presenting no contrasts in colors, and fitting easy about the person. Experience has proven that a light grey is less frequently struck by balls in an engagement than any other, and is therefore the most suitable under the fire of the Minnie rifle.

In addition to the clothing, the thickness of which must vary according to the weather, an overcoat and blanket, made water-proof, and a knapsack secured too, against rain, are to be provided. The shoes ought to have thick soles, made water-tight by being well oiled, and the socks soaped to prevent blistering or chafing.

The clothing should be frequently changed, washed and
dried, and no one ever allowed to go to sleep in them when wet.

I would advise the soldier to avoid tampering with medicines, indulging his appetites or passions, never to drink spirituous liquors, but to live temperate in all things. Discipline in the army implies a life of self-denial as well as of great exposure and hard service; and good health is an absolute requisite to discharge its duties. Though sentence against moral sin may not be speedily executed, yet every infraction of hygienic rules is immediately visited with suffering. In this respect be sure your sin will find you out, for it is an inflexible law of nature, without variableness or shadow of turning, that all her violators shall individually and peremptorily be punished.

All military men ought especially to be vaccinated.

Cheerfulness, too, is a great promoter of health, as a consciousness of right is to courage.

As the camp is no place for the sick, the sanitary question is the all important one with the surgeons. Five to ten per cent more die from diseases contracted during a campaign than in battle, and whenever possible, hospitals or barracks should be provided for the sick, particularly during epidemics. We are to recollect too that our volunteers are gentlemen, and not drafted or mercenary troops; and in their treatment, if a distinction is made in favor of any class in the army, it should be the soldier in the ranks, who, in every sense, bears the heat and burden of the day.—Nashville Journal of Medicine and Surgery, July 1861.

In view of the great want of some convenient work on Military Surgery, we present in the present number the first portion of a valuable little Treatise recently published by Dr. S. D. Gross, of Philadelphia. The book trade between the two sections of the continent having been interrupted, it has rendered it impossible for the publishers to furnish the work. We do not consider that their rights or those of the distinguished author are in the least violated by giving the work to the Profession, serially, to the extent of the circulation of a single Medical periodical.