well-marked, and the best descriptions we possess of white swelling have been derived from the morbid appearances of this articulation. The ligamentous and sub-synovial tissues are more subject to extensive and severe change in the knee-joint than elsewhere. Hence we often find its ligaments tumefied, infiltrated with imperfect lymph, or so much softened, and so lax, that the movements of the affected joint are freer than in the healthy state. The synovial membrane presents every degree and grade of inflammation. The deposit of lardaceous matter is most abundant about the insertions of the crucial ligaments, and the absorption or ulceration of the hard parts takes place most readily wherever the joint is most subject to pressure. The extensive destruction of parts consequent on scrofulous disease of the knee-joint often gives rise to secondary displacement of the bones, which may be partial or complete. In a few cases, where destruction of the cartilage has not proceeded far, the knee projects inwards, and an incomplete displacement of the articular surfaces is observed. The most common form is that on which the tibia is slightly thrown back on the femur, while it is, at the same time, rotated outwards, displacing the patella with it. In many other cases the head of the tibia is displaced directly backwards without any rotation. Here the posterior edges of the condyles of the femur are found to have been flattened by absorption or ulceration, the tibia glides backwards on them, and muscular action, or even a false position of the limb, may easily produce an incomplete displacement, which subsequently proceeds to complete luxation. When this has taken place, by endeavouring to extend the limb we can easily trace the shafts of the femur and tibia, and ascertain that the axis of the one is placed in front of the other. Sir Astley Cooper mentions, in his lectures, a case of secondary luxation of the tibia forwards. This must be excessively rare, I do not remember to have met with a second example on record.

Scrofulous disease of the ankle is mainly characterized by the remarkable swelling about the anterior part of the joint. The articulation seldom contains much fluid, yet abscesses and fistulous openings are very common. The malleoli are usually enlarged, and somewhat more apart from each other than in the natural state. Displacement of the articulating surfaces is very apt to take place as a result of bad position of the limb, but the luxation is never complete as in the hip and knee. Caries and necrosis are more common in scrofulous affections of the joints of the foot than in other articulations; for the smaller joints, however, it is not easy to say whether the caries has commenced within the cavity or in the bones immediately contiguous to it. I am induced to think that the smaller bones are just as often attacked as the articular membranes and cartilages.

In the shoulder-joint, scrofulous inflammation does not at first give rise to much appreciable swelling; and when pus is secreted into the joint, it finds a ready exit along the tendon of the biceps. In children, the head of the humerus is often the seat of scrofulous tumefaction; and in adults, destruction of the head of the bone and glenoid cavity from scrofulous ulceration may produce such a depression beneath the acromion as to simulate luxation in a very close manner. M. Cruvelhier doubted whether secondary luxation of the shoulder-joint ever occurred as an effect of disease; but in a note to his work on Pathological Anatomy, he relates a case which has induced him to alter his opinion and admit the lesion, though one of very rare occurrence.

The elbow-joint is almost as frequently the seat of scrofulous disease as the knee-joint; yet the affection presents a remarkable difference in the two articulations. In the knee we find a great tendency to the deposit of lardaceous tissue; in the elbow, the tendency is rather towards an effusion of lymph; and hence the cartilages are less extensively altered, and there is a greater tendency to cure by false ankylosis. When pus is secreted in the cavity of the joint, it generally makes its way posteriorly on one side of the olecranon, where least resistance is offered. Secondary luxation from ulceration of the ligaments and cartilages is very rare. The only one which has been observed is that of the radius outwards and backwards.

The wrist-joint may also be the seat of scrofulous disease exhibiting the various changes already described. Inflammation in this joint has a great tendency to extend to the neighbouring metacarpal articulations. Scrofulous disease in this joint seldom acquires the severity it exhibits in the ankle-joint, but the fibro-cartilage uniting the ulna to the radius is readily destroyed by ulceration, and hence the ulna may be luxated backwards. This is the only form of secondary displacement which occurs in the wrist-joint.

There are still some morbid affections in joints which would

seem to claim our attention, such as loose cartilages, fungoid tumours, interstitial absorption of the neck of the femur, &c.; but my object is to lay before you an account of those diseases which most frequently attack the principal joints of the body, and I must therefore, for the present at least, devote myself exclusively to them.

I have omitted to describe the appearances discovered after the cure of articular diseases; a brief notice of false and true ankylosis will supply this omission. Both forms of ankylosis are the result of the efforts made by Nature to repair the loss of substance caused by disease in a joint, and hence the abnormal appearance—in this instance they cannot be called lesions—will depend on the nature and extent of the reparative process. It may be fibrous or it may be osseous, in the one case occupying the ligamentous textures, in the other, the hard tissues of the joint.

The false or fibrous ankylosis, according to the views which I have explained in my first lecture, is an effect of the gradual transformation of plastic lymph into fibrous tissue. This lymph may have been effused into various textures of the joint, and thus gives rise to different kinds of false ankylosis. Sometimes you will find that the articular cartilages of both surfaces of the joint have been absorbed, and the opposite ends of the bones are firmly united by this fibrous tissue. Examples of this form are often seen in the knee-joint. In other cases the fibrous tissue is seen passing from one part of the synovial membrane to another, rather limiting the motions of the joint than producing a change equivalent to ankylosis, or the loss of motion may depend on changes exterior to the joint. Here the ligamentous tissues are found condensed and thickened with a quantity of dense fibrous tissue incorporated with them, or deposited in their cellular tissue. Osseous ankylosis, like the former, may take place in the joint or exterior to it. When the cartilages of a joint have been destroyed by ulceration, and the compact layer of bone underneath them has been damaged, a powerful attempt at repair is sometimes made by new osseous formation. This is in excess, and both the denuded surfaces become more or less completely incorporated with each other by new bony matter, or the union may be of a mixed kind, osseous at some points, and fibrous at others. Osseous ankylosis from deposit of bony matter external to the joint, is not often observed, except in the vertebræ, and I am inclined to think that it is rather connected with disease of the periosteum than of articular tissues. It is often a result of chronic rheumatism, but here the osseous splints in many cases pass from one bone to another, leaving the joint untouched. The deposit of osseous matters may take place in the form of splints or bands, or the whole joint may be enveloped in a single case of bone.

SUGGESTIONS

FOR A

SURGEON'S ARRANGEMENTS IN PREPARATION FOR A NAVAL ACTION.

By SIR BENJAMIN F. OUTRAM, C.B., F.R.S.,

FELLOW OF THE ROYAL COLLEGE OF PHYSICIANS, AND INSPECTOR OF HOSPITALS AND FLEETS.

Preliminary.—The surgeon in chief appointed to a ship of war should be duly sensible of his great responsibility, and picture to himself the overwhelming destruction of life and limb likely to result from the employment by an enemy, of the explosive and other very ponderous projectiles recently introduced to naval warfare.

He must therefore endeavour to prepare and fortify his mind by anticipating events, in order to act with due calmness and energy in the emergency of battle.

He should make every possible anterior arrangement, giving full and plain instructions to his assistants and others stationed in the cockpit, with the view of preserving order and of obviating hurry and confusion in the day of trial. Thus, he will be enabled to render prompt and efficient help to the wounded; and although amidst an awful scene of suffering and bloodshed, and in smoke, din, and uproar, almost inconceivable, he will be able faithfully and fearlessly to do his duty, and happen what may, to preserve his self-possession, undismayed by the horrors around him.

"Si fractus illabatur orbis,
Impavidum ferient ruinae."

With the hope, therefore, to assist young medical officers in acquiring this tranquil state of mind in difficulty and danger,

I have ventured to copy off certain of my cockpit arrangements, written long ago, and antecedently to a desperate but brilliant night action, in the which I found them essentially useful; and I have added such other suggestions as further experience and reflection render applicable to the present times.

Before, however, commencing the detail, I would observe, that of late, in British ships of war very convenient dispensaries and dépôts (under the able direction of Sir William Burnett, K.C.H.) have been fitted in the cockpit, to contain all medicinal and chirurgical appliances: but in case such receptacles are not supplied, they must be erected in the most convenient places, and should hold an ample reserve of the following articles, so arranged in drawers and separate divisions, as to be instantly ready for service—viz.,

Screw and hand tourniquets; splints and pasteboard; bandages and compresses; lint and fine rags; tow in firm rolls; sponges and soap; spare linen, cotton, flannel, &c.; adhesive plaster, spread; court plaster; ligature, two tenacula, and curved needles; silk thread, pins, tape, &c.; pots of soft ointment. Two trays, with divisions, should likewise be ready to receive portions of the above for immediate use, as hereafter explained.

The undermentioned articles, in well-labelled bottles, should also be at hand, secure from breakage or misapplication—viz., spiritus vel aqua ammoniæ; aqua vitriolica cœrulea, as a styptic; tinctura benzoës composita; oleum terebinthine; acetum lithargyri; oleum lini vel amygdalæ; tinctura opii; vinegar; linimentum saponis; brandy or rum, and wine.

Clearance for Action.—When an action is expected, and all hands are summoned by the drum to their respective quarters, the sick berth upon the gun-decks must immediately be cleared by the attendants, (quartered near for convenience,) and the sick and disabled, as well as all movables, carried to a place of security below.

Cockpit or Surgeon's Station.—The cockpit and neighbouring berths and cabins must be free from all superfluous lumber, and nothing suffered to remain in the way which is not indispensable.

Tables and Chairs.—Two large strong tables will be required, and ought to be firmly secured to the deck by cleets and lashings. The one may be placed on the starboard, the other on the larboard side of the cockpit.

A smaller table should also be fixed on each side for purposes hereafter mentioned.*

Two or three arm-chairs should be ready for the first wounded, and others brought to the steward's rooms, cabins, &c.

Platforms for the Wounded.—Platforms, for the reception of the wounded, must immediately be prepared in the vicinity of the cockpit, and in the most eligible situations the ship may afford. (The cable-tiers are objectionable, if anchorage is at all probable.)

Light.—The cockpit must be well and safely lighted. Two clear lanterns should be suspended over the large tables—two over the dépôt for bandages, &c., and the dispensary—two in convenient situations on either side, and others over the platforms, cable-tiers, and well. Two wax candles in flat candlesticks, with snuffers, should be lashed on each small table, and more may be ready in the steward's room and cabins adjacent, to light in a moment. A spare movable glass lamp should also be in the hand of a careful attendant, to prevent the necessity of carrying about naked candles, or of disturbing those in fixed positions.

Water and its Receptacles.—Care must be taken that there be an abundant supply of good water, in a convenient situation; and kettles of hot water which have been placed on the fire, prior to its extinction, should be seized and brought down to the cockpit.

A bason, with sponges and towels, ought to be on each small table; and buckets or tubs may stand near, with swabs and sand.

Tourniquets, Splints, &c.—All the tourniquets should be loosened and ready for instant application. Three with their compresses, and two pairs of splints may be laid for the early wounded on each of the smaller tables, the rest being kept in reserve in their proper place.

Those tourniquets, especially belonging to the cases of amputating instruments, should be always retained therein, for operations only.

Surgical Instruments.—The cases of capital instruments should be unlocked and laid, without parade, on shelves with high edges over the surgeon's cockpit-cabin-door, unless there are proper places for them in the dispensary or dépôt. Those of the second surgeon may, in like manner, be on the opposite side; but no instrument ought to be removed from its case until actually required. The pocket instruments—viz., probes, forceps director, tenaculum, scalpel, spatula, and scissors, may be in the trays lashed on each of the smaller tables.

Dressings and other Necessaries.—Pledgets of tow, lint, and linen, spread with ointments; dry lint and rag; a salvatory; sheets of court plaster and of adhesive plaster, a few bandages and compresses, fine flour, ligatures, curved and common needles; silk thread and tapes should also be disposed in the trays on both the smaller tables, but only in small quantity to prevent disorder, a more ample reserve being in the large drawers or receptacles of the dépôt or dispensary, each in its appropriate locality.

Position of the Medical Officers and Civilians.—The surgeon and one or two of the civilians or non-combatants, may arrange to take their station at the tables on the starboard, and the second surgeon with assistants on the larboard side, and if many wounded be rapidly brought down, the latter might take the slighter cases, while those likely to require operations are attended to by the surgeon himself.

Finally.—It is unquestionable that, when the wounded are very numerous, many lives might be saved by previous judicious arrangements and good order, which would be lost by the want of due preparation *before*, and presence of mind *during*, the action; therefore the surgeon should now calmly and carefully review all that has been done, to satisfy himself that nothing through oversight has been forgotten; when, finding everything as it ought to be, and all around him duly instructed in their duties, he should await the event with tranquil fortitude, in perfect readiness to render every possible assistance to his unfortunate shipmates.

In the possibility of an alarm of fire, or the explosion of powder, the surgeon should previously be empowered by the captains to order the magazine doors to be instantly closed, and no more cartridges to be handed up until the danger be over.

This order being promptly given by myself, was probably the salvation of the *Superb* in July, 1801, when two cartridges exploded on the lower gun-deck, by which a lieutenant and several men were desperately burnt and wounded.

Cockpit Arrangements for Civilians and Non-Combatants.—The particular attention of the chaplain, purser, and other civilians, should be directed to the following regulations, (as well as the previous ones to which they refer,) all of which should be copied by them, or deeply impressed on their minds, in preparation for the time of need, when they would materially assist and relieve the medical officers.

Civilians in preparation for, and previously to, Action.—

To see the cockpit-ladders properly secured.

To send down the ward-room or other strong tables and chairs.

To prepare and fix the various lights as above.

To have in the cabins several bottles of wine, spirits, water, and vinegar, &c., with glasses and tumblers.

To examine the water-cask or tank, and satisfy themselves as to the quantity as well as quality of the water.

To order the receptacles for it, basins and buckets, and also swabs and sand.

To arrange and smooth the platforms for the wounded.

To stick pins in their sleeves, and provide themselves with scissors, knives, needles, thread, and smelling-salts or hartshorn.

Civilians during the Action.—To cut away and remove clothes and other incumbrances from the wounded, and assist in lifting them, if required, on the larger tables.

To assist in removing the wounded seamen and mariners to the platforms, after being dressed by the surgeons; soothing and consoling the poor fellows, and offering them, when faint, wine, water, refreshment, hartshorn, &c.

To cause the quiet removal of any of the wounded who may expire after being brought down, in order that the surviving sufferers may not be disheartened by the appalling spectacle of their slaughtered shipmates.

To apply the tourniquet (according to previous instructions from the medical officers) on those who are bleeding, in case the surgeons should be overwhelmed by numbers at the time.

To attend to the safety of the open lights and lanterns,

* An ingenious operating table has been invented by Dr. Veitch, Deputy-Inspector of Naval Hospitals, but is not yet in general use.

snuff them occasionally, and lend instantaneous aid in the event of any inflammable matter being accidentally ignited, by sparks or otherwise.

Great care must indeed be taken that no loose tow be permitted to lay about, especially when the passages and doors of the magazine or light-room are open, because, from its inflammable texture, the most dreadful consequences might arise should the smallest portion take fire.

An intelligent boy, or woman, if on board, may be stationed to offer pins, shift bloody water, hand and wash sponges and hold lights, under the direction of the purser and chaplain.

Civilians after the Action.—To order cots to be got ready for wounded officers, and hammocks for the men who can be safely taken from the platforms, and aid in their gentle removal to whatever place may be appropriated for their reception, kindly cheering and encouraging them the while.

In moments of leisure to examine those on whom the tourniquet has been applied; if any one is found to bleed, to screw the tourniquet as tight as possible, and acquaint one of the medical officers.

General Surgical Suggestions.—The principal objects of the surgeon during a naval action, are to stop all hæmorrhages and to dress wounds not seeming to require any important operation. If possible, therefore, he should content himself with endeavouring to save life, and restraining the effusion of blood, until he be less hurried.

Immediate amputation may, however, become necessary, from a limb being shattered so high that a tourniquet cannot be well retained, or where a limb has been completely destroyed. But, even in this latter case, if the wounded are numerous and crowding fast upon him, I should judge it better to apply the tourniquet, and wait till after the action.

All gun-shot wounds should be dressed, at first, in the most simple manner. When every extraneous substance is removed, the parts are cleaned and the bloodvessels secured; pledgets of lint or tow spread with ointment should be applied, and a compress of linen, the whole being gently secured by two or three turns of a roller; or, if the wound or fracture be on the lower limb, with a tailed bandage.

If balls, splinters, portions of clothing, loose spiculi of bone, or other extraneous bodies can be easily removed, they should be extracted at once; but if from the seat or direction of the wound there arises much difficulty it will generally be better to defer their removal until a calmer interval succeeds.

Wounds penetrating the thorax or abdomen, when not immediately fatal, are to be treated as in the last suggestion;—foreign bodies must be removed, protruded parts returned, bleedings moderated, and the most simple dressings applied.

In cases of fractured cranium, with a depression of a portion of the bone, the elevator must be applied so as to relieve the brain from pressure if possible; but the more delicate use of the trephine must be deferred until after the action.

If fractured or dislocated limbs are hastily set or reduced during the engagement, they should be carefully examined as soon as possible afterward, and the bones properly re-placed.

Bloodvessels are best secured with the tenaculum and noose, care being taken to avoid the inclusion of nerves; but where there is difficulty from the depth of the parts, or the minuteness of the arteries, the needle may be employed.

It is a good general rule to apply the tourniquet as high as possible—*i. e.*, in the upper extremity, immediately below the shoulder; and in the lower near the groin; excepting when amputation is to be performed above the ankle, or below the knee, when the pad of the tourniquet may be placed in the ham.

The wounded, when dressed, should in general be removed from the cockpit to the platforms, previously prepared, but officers and those requiring capital operations, or frequent attention, may be put into the adjacent berths and cabins.

In engagements with fleets there are often intervals of firing, occasioned by necessary evolutions, and these intervals may afford time for urgent operations, especially if there be more than two medical officers on board, and the wounded are not overwhelming.

But as an action between single ships, in close combat, usually terminates within two hours, and seldom exceeds three, a great deal of confusion and mischief might arise from commencing to operate without requisite assistance, when no harm could happen from a short delay.

Amputation.—The surgeon must amputate generally.

When, together with extensive and contused wounds of the soft parts, the bones are much broken and splintered.

When the principal bloodvessels of a limb are destroyed.

When a joint is considerably injured.

When the whole or very great portion of the muscles and integuments have been totally carried away by ball or splinters.

When part of a limb has been carried away.

It is desirable to preserve as much of a limb as can be saved without hazard, with one exception, however—*viz.*, that it is better to amputate immediately above than directly below the knee-joint, where the bones are large and the soft parts are deficient; but it should also be borne in mind that in gun-shot and severe sabre wounds, the integuments and muscles may be injured and the bones splintered far beyond the first apparent extent of the mischief.

N.B. A great part of these arrangements being applicable to line-of-battle ships, they must be modified according to locality, space, and other circumstances, for frigates and smaller vessels.

ON THE NATURE AND CAUSES OF THE DISEASES OF EMIGRANTS.

By C. COOPER, Esq., M.R.C.S.E., Dublin.

In these times of railroad enterprise and steamboat travelling, a voyage across the wide Atlantic, or still wider Pacific, is spoken as lightly of, and thought as little about, as a pleasure trip on one of our large rivers; but the time was, and it has not long gone by, when even a voyage across the channel, or a visit to the Continent, was thought almost an heroic accomplishment. In those days an accouchement at sea was counted a wonder; the babe and its mother were noticed as prodigies, and a birth at sea has even formed the subject of a novel; but at the present time few, if indeed any, of our emigrant packet-ships cross the ocean without at least one birth; and so common has this become, that no notice is now taken of it, except merely to mention the fact in the ship's manifest or the passengers' way-bill.

Of late the tide of emigration has progressed, and is still progressing, to an amazing extent, particularly from Great Britain and Ireland, and we find in every good seaport town in the United Kingdom packet-ships for the conveyance of emigrants to various foreign ports; and as this tide of emigration has gone on, has there been no improvement in the means and ways adopted for the transportation of so many of our fellow-countrymen to foreign countries? Most decidedly there has; but although much has been done, still much, very much, remains to be done, and there are many and vast improvements yet wanting even in our finest and best packet-ships.

In *THE LANCET*, published about last April, I saw an article by Mr. T. Westropp upon "Emigrants and their Diseases," in which he made several remarks on the accommodation for passengers in the ship he sailed in. His remarks are undeniable as far as respects most, if not all, the passenger-ships from Irish ports. I myself have visited many of them when ready to sail, and have always found the accommodation miserable. But the regular lines of packets from English ports are more neatly and permanently fitted up, and the difference is evident to any one who may go on board one in Dublin, and then visit one in Liverpool and London. Just to show a difference, I will allude to two points Mr. Westropp mentions concerning the ships he was in—*viz.*, the water-closets, and the means of cooking for passengers. What are these on board a Liverpool liner, not to go to other ports in England? Here we have the water-closets for steerage passengers permanent fixtures, forming a portion of the ship, as it were built in with her bows, always kept clean, and from which you never get an unpleasant or an unhealthy effluvia; and then what are means of cooking on board these packet-ships? Regular passengers' galleys as good as the cabin galley, supplied with fine large stoves, ovens, and boilers, and, in addition to this, provided with passenger cooks and stewards. But this arrangement I never saw, nor do I believe that it is to be found, in any of the ships from Irish ports. From thence the only water-closets I ever saw were mere temporary places—boxes of wood made by nailing a few boards together, and that in so flimsy a manner, that they could not possibly exist even half a voyage; and from the way in which they were made, they could not but become dirty and offensive, and would be far from conducive to health or cleanliness. And what is the passengers' cooking apparatus on board one of our Irish emigration ships? A comfortable galley, a good stove supplied with oven and boiler?—nay, this would be too good for poor Irishmen. Their galley is a case of wood, lined with bricks and fronted with bars—a common kitchen-grate erected on deck. It may answer for cooking; but the smoke from these must, as it is wafted by