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CASE
OF
INTRA-ORBITAL ANEURISM,
CURED BY LIGATURE OF THE COMMON CAROTID ARTERY.

By DAVID GREIG, M.D., F.R.C.S.,
SURGEON TO THE ROYAL INFIRMARY, DUNDEE.

Reprinted from the Edinburgh Medical Journal, November 1862.

Jane Jones, aged 47 years, a weaver, a thin emaciated woman, was admitted under my care into the Dundee Royal Infirmary, on the 28th ~~April~~ 1862, suffering from aneurism in the left orbit. She stated, that a fortnight before admission, while carrying a load of yarn upon her shoulder, she fell down a stair, and, in falling, struck the left side of her head against the framework of a loom. Her eye was not hurt, and she felt no pain in it at that time. She remained for a moment or two stunned, felt much confused and somewhat sick, lay in bed for the most part of that day, and although feeling "stounding" pains in the head and a singing noise in her left ear, she returned to her work next day. On the morning of Saturday the 26th April (two days before admission), she had to sit two hours in the open air waiting to get into the factory in which she worked, and although the morning was a warm one, she had a sharp shivering. This soon passed off, leaving a severe frontal headache. She worked for two hours however, when the headache getting worse and the shivering returning, she went home, took a warm drink, and went to bed. In the afternoon, she for the first time began to complain of her left eye; swelling of both eyelids commenced, with great pain in the orbit, impaired vision, and watering of the eye. She also complained of a singing noise in the left ear. Fomentations were applied, but gave little or no relief. Next day Dr Pirie saw her, and, suspecting an aneurism, requested me to visit her along with him. My first impression was that it was a case of acute abscess in the orbit; but when we again visited her next day, we both agreed that it was an aneurism, and, as there was deficient

"Index"

Sansom Arthur - Mortality after Amputations of Extremities. London

History of the case of Wm Forder

Seutin - Memoire et observations sur les Kystes du Cou - Bruxelles 1853

Bertherand - Des plaies d'armes à feu de l'Orbite Paris 1851

Bryant Thomas - Clinical Surgery London 1860

Longmore Th: - Remarks on two cases of Helés - London 1863 -

Buchanan G. Tracheotomy in Diphtheria Glasgow 1865

Buchanan G. Excision of lateral half of Tongue — Edinburgh 1867

Spence J. Hip joint amputation Edinburgh 1865

Roux Jules - Fistules du Larynx Paris 1855

Roux Jules - Leçon sur les appareils à facture et à compression Paris 1859

Wiblin J. Scrotal Elephantiasis London 1863

Paris Amédée. Memoire sur la Trépanation Céphalique. Paris 1865

Hall Sir John - Reply to Dr Sutherland Reply - London 1858

Hospital Service French Army in the East

Arrault Henri - Perfectionnement du materiel des ambulances volantes - Paris 1861

Arrault Henri - Appendix to above Paris 1862

Hargrave Wm - Ligature of left common Iliac artery - Dublin 1865 -

Fayrer J. - Surgery in Bengal Calcutta 1865 -

Fayrer J - Hip Joint Amputation Calcutta 1864.

Bryant Th: Vesico and Recto vaginal fistulae

Buchanan G. Surgical cases. Glasgow 1862

Greig D. Infra orbital Aneurism

accommodation in her own house, she was removed to the Dundee Royal Infirmary, and placed under my care.

On admission, the left eyeball is much more prominent than the right and nearly covered by the lids, which are protruded, swollen, œdematous, and of a livid red colour. The conjunctiva is in a state of chemosis and overlaps the cornea. The vision of the eye is reduced to an obscure perception of light. Over both eyelids, all round the eyeballs, but more especially over the inner half of the upper eyelid, there is a strong pulsation, synchronous with the cardiac beats, and arrested by compression of the left common carotid artery. Pulse 80; no pyrexia. A small poultice was applied over the eye, and some opening medicine administered. She continued much in the same state during the next day (29th), but slept for a few hours.

30th March.—The swelling of the eyelids and the pulsation have increased, the eyeball is more prominent, and the power of distinguishing light from darkness gone. I now resolved to ligature the common carotid artery, and immediately proceeded to do so.

The patient having been placed under the influence of chloroform, an incision about an inch and a half in length was made over the course of the vessel, parallel with the inner margin of the sterno-mastoid muscle. The sheath of the vessel was soon exposed, with the descendens-noni nerve lying on it. The sheath was opened on the inner side of this nerve, the ligature passed (from without inwards) round the artery and tied, without any other nerve or vessel having been seen during the operation. The integuments were brought together by a silver suture. The pulsation in the swelling ceased immediately when the ligature was tied. On recovering from the chloroform she felt very sick, and repeatedly vomited during the course of the day. In the evening her pulse was 84, skin moist, and she felt better than she had done since the operation.

She was ordered a grain of opium and two ounces of port wine.

1st April.—Passed a quiet but sleepless night; swelling of eyelids decreasing; wound looking healthy. Bowels open.

3d.—Still improving; power to move the eyelids returning. No power to move the eye; no vision.

4th.—Pulse 100; vision to the extent of being able to distinguish light from darkness.

5th.—Swelling still subsiding, and eyelids now of a natural colour. No return of pulsation. The vision has so far returned that she is able to tell the number of fingers held up and the difference of colours. Pulse 96; sleeps well; bowels regular.

7th.—Vision much improved. Power of moving eyelids improving. Slight motion of eyeball upwards, inwards, and downwards, but not outwards. To have intermediate diet.

12th.—Symptoms all favourable; ligature firm; movements of eyeball improving, but still no power to turn the eye outwards.

23d.—Ligature removed to-day, being the twenty-fourth day after the operation.

24th.—To-day she was discharged from the Infirmary, cured. No return of the pulsation; no swelling; vision nearly as good as before illness. Can move the eye and eyelids well, with the exception of power to turn the eye outwards, which is still entirely gone, and which gives the eye a peculiar squint.

Since leaving the hospital the patient has frequently called on me, and I have been pleased to notice the gradual return of power to the external rectus muscle, until now (1st August), when I find the eye has quite recovered its natural appearance, and can be freely moved in all directions.

My object in publishing this case is to add one more to the list of recorded cases of intra-orbital aneurism,—these cases, as far as I am aware, being by no means common, and because I think it is interesting in many respects. The origin of the aneurism in this case can, I think, be clearly traced to the blow on the head which she received, although it is not very easy to see why one of the orbital arteries should suffer from this blow, nor why this should not become evident until twelve days after the accident. The complete loss of vision, loss of motion, and state of the orbit otherwise, before the operation, and their complete recovery after it, is a very interesting feature in the case, and I trust may give encouragement to any medical brother who may have such a case under his care. With regard to the operation little need be said; although not common, it is very simple, and no provincial surgeon need be afraid to undertake it. Mr Syme records a case, in his "Observations in Clinical Surgery," of aneurism in the orbit, in which he tied the common carotid artery with complete success, and mentions his case as the only one of the kind which had occurred in Scotland. Similar cases have occurred in England and on the Continent, where ligature of the common carotid has, as a general rule, been successful in effecting a complete cure. Ligature of the common carotid artery is undoubtedly the proper treatment for cases of this kind, and when we think on the simplicity of the operation, it is with surprise we hear proposed instead, such means as electro-puncture, the injection of coagulating fluids, or compression of the artery.

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SURGICAL CASES.

BY

GEORGE BUCHANAN, A.M., M.D.

SURGEON TO THE GLASGOW ROYAL INFIRMARY; LECTURER ON ANATOMY, ANDERSON'S UNIVERSITY, ETC.

From the GLASGOW MEDICAL JOURNAL, *October* 1, 1862.

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1862.

SURGICAL CASES.

In former numbers of this Journal I gave a short account of a few of the more interesting cases occurring in the wards under my charge. The present paper contains a vidimus of all the cases requiring operations of any importance, which were admitted to wards 16, 27, and 30, from the 1st of February till the 1st August, 1862. This period of six months gives a fair idea of the average amount of surgical practice which is witnessed in our noble hospital; and I bring these statistics forward at this season when the merits of the various medical schools are being canvassed, to show that with ordinary care in observation, the student can be at no loss to acquire an extensive knowledge of practical surgery. When it is remembered that there are three other surgeons, each in charge of three wards, who receive patients in rotation, it will at once be seen that the field of observation presented in the Glasgow Infirmary is equalled in few other hospitals. I have excluded from the table all the minor operations, as catheterism, amputations of fingers and toes, and partial of hand; as also dislocations of recent standing, which were reduced by my assistant soon after their admission. If these were added to the list, it would be much larger, but not being kept long in the hospital they are not entered here. Those interested in the inquiry I may refer to the annual report, which gives tabulated statements of the entire practice of the hospital, and well repays a careful perusal.

The total number of cases, treated in wards 16, 27, and 30 from 1st February to 1st August, was 253. Of these 243 were dismissed cured or relieved, and 10 died.

It would be tedious to give the details of all the cases admitted, as many were of less importance than others; but I may state the results shortly thus:—

Ward 30 is for females and young children, and in it there were 62 cases, with 1 death; ward 16 for chronic diseases in males received 113 cases, of which 3 died; ward 27 for accidents, 78 cases and 6 deaths.

With these explanations I present the following table of the operative surgery in the above wards for the six months mentioned:

Date of Admission.	Date of Operation.	Patient's Name.	Ward.	Age.	Disease or Injury.	Cause.	Duration.	Operation.	Result.
Jan. 22	Feb. 1	D. Anderson	16	27	Strumous knee-joint		8 years	Ampt. of thigh (Teale's).	Well.
Feb. 11	Feb. 11	W. Love	17	27	Co. com. fract. of arm	Machinery	An hour	Ampt. mid. humerus.	Well.
" 11	" 24	T. Duff	19	27	Traumatic aneurism	Stab in thigh	26 days	Sac laid open and vessel ligatured.	Well.
Dec. 21	" 26	J. M'Pherson	31	27	Caries of tarsus		— years	Syme's at ankle.	Well.
Feb. 17	" 26	J. Wood	6	30	Vesical calculus		12 months	Lithotomy.	Well.
" 14	" 22	A. M'Millan	25	30	Talipes varus	Congenital		Tenotomy.	Well.
" 7	" 22	A. M'Ilwee	13	16	Caries of tarsus		2 years	Chopart's.	Well.
" 3	" 12	T. M'Manus	65	16	Inguinal hernia			Radical cure.	Unsuccessful
" 19	" 20	T. Smith	16m	30	Constriction of anus		Congenital	Sphincter cut and orifice dilated.	Well.
" 27	" 28	J. Conolly	33	30	Dislocation of elbow	Fall	16 days	Reduction.	Well.
" 27	" 27	J. Knox	39	27	Co. com. fract. of leg	Railway accident	3 days	Ampt. below knee.	Well.
Mar. 7	Mar. 7	Mrs. Eadie	55	30	Strang. femoral hernia		32 hours	Sac opened, &c., &c.	Well.
" 14	" 19	R. Kelly	17	27	Vesical calculus		6 years	Lithotomy.	Well.
" 19	" 20	J. Crawford	11	27	Dislocation of elbow	Fall	6 weeks	Reduction.	Well.
April 4	April 4	D. Campbell	43	27	Co. com. fract. leg	Railway accident	4 hours	Ampt. of thigh.	Well.
		D. Crichton	38	27	Tumour of parotid (adenoid)		9 years	Excision.	Well.
Feb. 8	Mar. 31	J. Law	14	16	Necrosis of humerus and ulna	Periostitis	6 weeks	Removal of humerus and ulna.	Well.
May 14	May 22	J. Nimmo	56	16	Caries of tarsus		2 years	Ampt. of low. leg.	Well.
" 22	" 28	A. Smith	16	16	Strumous knee		8 years	Ampt. of thigh.	Well.
" 16	" 31	J. Galbraith	18	16	Caries of tarsus		2 years	Pirogoff's.	Well.
" 30	" 30	J. Laidley	20	27	Co. com. fract. arm	Machinery	2 hours	Ampt. at elbow.	Well.
" 30	" 30	D. Shaw	16	27	Caries of tarsus		2 years	Syme's at ankle.	Doing well.
" 22	" 28	S. Montgomery	14	30	Caries of elbow		1 year	Excision of joint.	Well.
June 4	June 7	M. M'Crorie	21	30	Recurrent fibrous tumour of hip		2 months	Excision.	Well.
" 11	" 11	J. Smith	39	27	Strang. hernia		10 days	Sac opened and omentum removed.	Death.
" 7	" 12	A. M'Dougal	7	27	Laceration of hand and arm	Wheel of cart	5 days	Ampt. upper arm.	Well.
" 24	" 27	W. Dunlop	54	27	Epithelioma of lip		2 years	Excised.	Well.
" 23	" 27	J. Docherty	54	16	Urethral calculus			Extracted.	Well.
" 7	July 2	A. Mein	10	16	Caries of elbow		5 months	Excision of joint.	Doing well.
July 2	" 2	J. Cunningham	35	27	Neuroma		10 years	Removal of tumour.	Well.
" 4	" 4	R. M'Laren	12	27	Extravasation of urine	Kick	4 days	Perineum incised.	Doing well.
" 14	" 14	D. Martin	29	16	Reducible hernia		10 years	Radical cure.	Well.
" 9	" 16	K. M'Manus	28	30	Caries of elbow-joint		12 years	Excision.	Doing well.
" 17	" 17	T. Derrien	14	27	Co. fract. of femur at trochanter		8 hours	Ampt. at hip joint.	Death.
" 17	" 19	John Parker	53	16	Epithelioma		2 years	Restoration of lip.	Well.
" 21	" 24	J. Pettigrew	29	16	Fistula in ano		4 months	Incision.	Well.

From the foregoing table it will be seen that there were 36 operations of various degrees of importance and danger, and that of these 34 cases recovered, while two of the patients died. From such a small number, it is obvious that no conclusion of any general interest can be drawn; still, when the nature of many of the cases is studied, it points to a very good sanitary condition of the hospital that so many patients have passed successfully through the operations detailed. A great deal of discussion has lately taken place in Paris concerning the salubrity of the French hospitals, and most of them, even the newest, have been denounced in no measured terms as almost charnel-houses; but it is a source of much gratification to the surgeons of our Infirmary that the wards under their charge, and especially those in the magnificent new surgical hospital, are so well ventilated, so clean and airy, that operations of the gravest nature may be undertaken with a prospect of success as great as, if not greater than in private houses. It is true that epidemics of erysipelas or hospital gangrene may break out; but fortunately the extent of accommodation is so great that in such an event it would be no difficult matter to empty the ward in which it made its appearance, and leave it unoccupied for some time. For more than a year I have not seen anything with the appearance of hospital gangrene, except in one case; and strangely enough it occurred in a lad whose fingers were removed in hospital, and who was sent to live at home and have them dressed there. After he had been a few days at home, he came back to show me the stump of the hand which had all the appearance of hospital gangrene; and, finding that he was compelled to lie in a close box bed in his own kitchen, and that he had not means of keeping it clean and ventilated, I admitted him to a side-room in the hospital, applied nitric acid to the sore, enjoined frequent irrigation with water, and ordered generous diet, so that in a few days the unhealthy aspect was removed from the sore, which then healed kindly.

The whole arrangements as regards heating, ventilation, water supply, &c., in the new building have been fully described by Dr. M'Ghie, the late talented superintendent, and experience has more than confirmed the anticipation of the most sanguine, as to their suitability for the purpose intended.

I add a few notes on the more important operations in the list.

Amputation at the Hip-joint.—In this case the injury was a severe compound fracture just below the trochanter. The patient, a lad aged 14, had been carried from a considerable distance, and was much weakened. The consultation recommended immediate operation. Little blood was lost; but the lad never rallied from the shock, and died in a few hours.

Amputation of the Thigh.—Three cases, all successful. Two

in boys for strumous disease of knee-joint. In one case amputation at the middle of thigh, in consequence of the bone being diseased low down, by flaps, which made an excellent stump. The other by a modification of Sedillot's or Teale's plan, viz., a large anterior flap dissected from patella, and a very short posterior flap, also did well.

The third case was that of a man who sustained a severe injury of leg by the wheel of a railway carriage. This case occurred during my absence, and was operated on by my colleague, Mr. Lister, who made flaps similar to those in the last case. The patient did well. The only point calling for remark in this method of operating is the occasional tendency to bagging, and the lodgment of pus in the anterior part of the stump. It occurred for a short time in the two cases detailed, and I have seen it in others. It does retard recovery when it takes place, but in the end the stump is very satisfactory.

Amputation of Leg.—Two cases, both did well. One for railway accident, the other for disease of foot, and involving the tibia too much to allow of operation at the ankle; both by a large flap posteriorly, and short anteriorly.

Amputation of Foot.—Four cases, one Chopart's operation. It has been doubted whether it is of any use to save that part of the foot which is left in this operation, as the stump is apt to be tilted up by the action of the tendo Achillis. I am perfectly satisfied with the result in this case, the boy walking with ease on the part of the foot remaining. While visiting the Bethanien hospital at Berlin last autumn, Wilms, the surgeon, showed me several cases which had turned out exceedingly well. He informed me that he always commenced by dividing the tendo Achillis to prevent its action as above alluded to.

In another case I performed Pirogoff's operation, leaving the posterior half of the os calcis. I have never seen a case in which I have been more satisfied with the result. The stump is nearly on the same level with the heel of the opposite limb, so that the patient can stand upright without any addition to the amputated part. At the time this patient was in hospital, Dr. Lyon showed me two cases in which he had performed a similar operation with the best results. Two cases of Syme's operation at the ankle—one cured; the other rather tedious in healing, being in a very strumous lad, but doing well, with every prospect of an excellent stump.

Amputation of Arm.—Three cases—one at elbow, two in upper arm—all for injury.

Excision of Elbow-joint for caries; three cases still in hospital, doing well.

Removal of nearly the entire humerus and ulna for extensive

acute necrosis. At present the greater part of ulna and nearly the whole humerus have been reproduced.

Hernia.—One femoral, cured.

One inguinal irreducible for ten days, strangulated for at least two days, and the prostration great. The intestine was adherent to the sac; but the adhesions were broken up with care. The tissues were highly congested, of a purple colour. The patient did not rally at all.

Lithotomy.—Two cases—one in a little girl reported in *Medical Times and Gazette* of 3rd May; one in a lad, by Dr. A. Buchanan's method with the rectangular staff. Both cases did well.

Traumatic Aneurism of Superficial Femoral Artery.—Sac laid open, and both ends of the vessel tied with a successful result. This case was fully reported in the April No. of this Journal.

The other cases do not require comment, and I have only to add that though such a detail as I have given does not contain anything new in the way of treatment, it gives an idea of the mixed class of cases which may be seen in the surgical department of our Infirmary.

The following were the causes of death in the ten cases which proved fatal of the whole number admitted under treatment:—

Acute periostitis in a strumous girl, involving the whole humerus and stripping the membrane from the bone, with rapid prostration of her strength.

Necrosis of tibia of long standing in a worn-out and dissipated man. His general debility precluded the possibility of amputation.

Large ulcer on leg in a worn-out subject. General state unfavourable to amputation.

Cut throat. Much blood lost before admission.

Sudden death in a negro, admitted with very large strumous glands in axilla and under clavicle. He sunk rapidly, and died very suddenly. Post-mortem examination disclosed no marked pathological condition to account for his death.

Laceration of leg, involving skin over knee-joint; also separation of integument over sacrum and loins; sloughing of tissues, involving knee-joint.

Two cases of extensive fracture of skull and effusion of blood between bone and membrane.

Strangulated hernia.

Smash of thigh, and subsequent amputation at hip-joint.

There is just one point connected with the treatment of wounds and amputations to which I may allude, not confined to my own practice, but employed by all the surgeons; that is, the simplicity of the dressings and applications. I would not have mentioned a treatment so commonly adopted, had it not been for an observa-

tion of a naval surgeon who has been following the practice of the hospital for the last three months. He remarked that he had been struck with the absence of all oily and greasy applications, and the almost universal use of water simply applied on a piece of lint. Every day's experience confirms me in the belief, that a strip of lint dipped in water and retained in contact with the wound by such a light bandage as will hold it in its place, is greatly preferable to the most ingenious and complicated bandages. The contrast between the surgery in different hospitals is most marked in this respect; and if those surgeons who have been searching for the cause of pyæmia, erysipelas, and other hospital scourges in the faulty architecture and ventilation of wards alone, would turn their attention to the dressings applied to amputations, they might find some reason to trace the fatal results to the method of treatment, as well as to the former source. Undoubtedly the quieter a stump is kept, and the less it is interfered with the first few days, the better will be the result. As a general rule my own practice is—after the flaps are brought together with wire sutures, a piece of wet lint is placed along the wound, and retained with a turn or two of bandage. In the evening my assistant cuts through the bandage and lays over the stump a wet cloth; or, if there is much pain, a piece of hot wet flannel, which is kept constantly moist. On the third, fourth, or fifth day according to the discharge, the dressings are removed and replaced by others as lightly retained. In about a week or longer, if there is not any tendency to contraction and cicatrization, a bandage is gently applied; and when the cicatrizing process is in full operation, the bandage is used more firmly to aid in giving a proper form to the stump. This I find to be the most suitable method of managing the majority of the cases which are the subject of operation in our hospital; and I have every reason to be satisfied with the results.

ON

VESICO- AND RECTO-VAGINAL FISTULÆ,

AND

RUPTURED PERINÆUM, &c.

By THOMAS BRYANT.

In the following paper I propose to make a few remarks on the subjects of vesico-vaginal and recto-vaginal fistula; to note down the principal practical points the observance of which are essential for success in such operations; and to demonstrate by the short record of typical cases the best means for their performance. I shall also illustrate in the same way the surgical treatment of ruptured perinæum, both simple and complicated, and, I trust, prove satisfactorily that the most severe examples of these affections are capable of repair, and that surgery has its triumph in this department of practice no less than in others.

CHAPTER I.

ON VESICO-VAGINAL AND RECTO-VAGINAL FISTULA.

It is neither necessary for me to enlarge on the causes of these affections, nor to dwell on the miseries which such conditions entail on the unfortunate women who are their subjects.

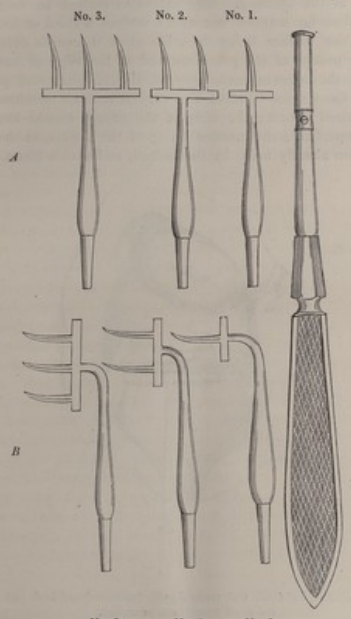
The latter are too well recognised by all people; and, as a surgeon, it is satisfactory to be able to prove that in the majority of, if not in all, such cases relief can be afforded, if not complete restoration to the normal condition.

In the treatment of recto- or vesico-vaginal fistula there are two chief objects which the surgeon has in view.

First, to pare with nicety and accuracy the whole margin of the fistula; and, *secondly*, to bring into, and to maintain in, close apposition the raw and incised surfaces. If these two ends be secured, the means by which they are attained are comparatively of small importance, although their simplicity is a point of considerable value. The chief difficulties of the operation are, it is allowed, generally met with in carrying out the first object we have mentioned, and its ultimate success most unquestionably depends upon the mode in which this step has been performed; for, however well the second step in the operation may be executed, failure must ensue if the first has not been fairly accomplished. The hope and aim of the surgeon in these cases is to secure union of the pared edges of the fistula by primary adhesion, and to obtain this result two clean and even surfaces must be placed and kept in apposition. Surgeons who have attempted to pare a fistulous opening, situated either on the surface of the body or in the vagina, well know what care is demanded to prevent any irregularity or raggedness of the wound's surface, and they well know that if this irregularity exists, primary adhesion of the edges cannot take place. It is this difficulty which, I believe, too often necessitates the repeated operations we hear of for the cure of a vaginal fistula; and it was to obviate such that I was led some four years since to the construction of the instruments which are illustrated below (modifications of that formed by Mr. Hillyard, of Glasgow), and which subsequent experience has fully proved to be of great value. I have reason to know that in other hands as well as in my own they have been equally serviceable, and that they have tended to facilitate the performance of a difficult operation, and render it more certain and satisfactory.

The advantages which are gained by the use of the instrument, are, *first*, the certainty with which the whole margin of

the fistula is incised; and, *secondly*, the accuracy with which the width, length, and evenness of the incision is secured.

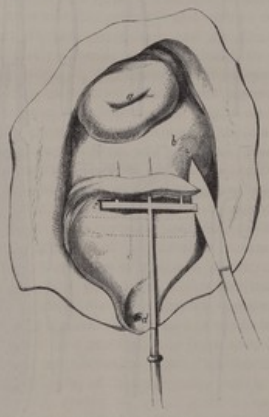


A. No. 1, 2, 3, Guides for transverse fistulæ. *B.* Guides for vertical fistulæ.

The following are the directions for its application:

Assuming that an operation for vesico-vaginal fistula is to be performed, and that the fistulous opening is an inch long,

the guide with three prongs (No. 3 A or B) should be selected, its width being sufficient to include the whole upper margin of the opening. The extent of surface to be pared should then be mapped out with a scalpel, a third or half an inch of raw surface being desirable when it can be obtained, and the prongs of the guide inserted at the edge of but not through the mucous membrane of the bladder, and passed *between* the tissues, beneath the vaginal mucous membrane to the required extent; the ends of the prongs should then be made to perforate the mucous lining of the vagina, at the line of incision already made by the scalpel, and with a blunt hook



View of vesico-vaginal fistula with pronged guide introduced, and knife with which the upper margin is to be incised.

a The os uteri. *b* The anterior wall of the vagina.
c The fistula, with the mucous membrane of its upper margin perforated by the No. 3 guide, preparatory to its removal.
d The urethral orifice. *e* portion of mucous membrane mapped out for removal.

The body of the patient is supposed to be turned over two thirds on to the abdomen.

the tissues thus included should be well pressed down to the prongs' base; the whole of this surface thus raised by the guide is then to be excised by one sweep of the scalpel, passed along close to the posterior margin of the instrument.

By this means the cleanness of the wound is guaranteed, and its extent accurately determined, not the slightest fingering or chance of causing any irregularity in the wound's surface is experienced; indeed, with the exception of the subsequent introduction of the needle, no instrument need touch the surface of the wound a second time. The lower margin of the fistula should then be treated in the same manner as the upper, thus completing the first and most important step of the operation.

The second step of the operation remains to be described, and although it may be equal in importance to the first, it is not one of difficulty, yet at the same time it requires some nicety in execution. The object is to bring the raw surfaces of the fistula into close apposition, and to maintain them there. This is to be carried out by means of sutures, the wire being the most convenient. The sutures should be sufficiently close to ensure the accomplishment of the object for which they are introduced, and may be fastened in any way which the operator prefers. The perforated shot applied to the twisted end of the wire answers every purpose, both fixing the wires and protecting their points. There is one point, however, of essential importance to be remembered in this the second step of the operation, and that is the distance at which the sutures are to be inserted from the margin of the wound; as a rule, the greater the distance the greater the advantage to be gained—a third, or half an inch or more being desirable. The edges of the wound are not to be adapted too tightly, for swelling will occur, and, as a result, ulceration in the line of suture is sure to follow. This point is as essential in all plastic operations as in the one we are now considering.

The sutures may be left in for six or eight days or more; but I believe it best to remove them as soon as the wound is healed, no good object being obtained by leaving them longer, and in some cases ulceration may be set up, which may interfere with, if not mar, the ultimate success.

The urine should be drawn off periodically after the ope-

ration, but it is not necessary to irritate the bladder by retaining the catheter in it.

A good opiate suppository should be given to relieve pain or local spasm, and perfect cleanliness is to be enforced during the treatment.

To illustrate the practice I have just briefly sketched the following cases may be related. The first two have been already published in a short paper printed in the 'Transactions of the Medical Society of London,' for 1861, but as they were amongst the first in which I employed my new instruments, I have taken the liberty of republishing them in the present form.

Case 1. *Vesico-vaginal fistula, under the care of Dr. Oldham and Mr. Bryant, from notes by Mr. Stamper.*—Esther H—, a married woman, æt. 40, was sent up to Guy's Hospital from Wales, by Dr. E. Lloyd, for operative relief. She was a healthy woman, and had given birth to seven children, the last being a year and a half old. The presentation was a cross one, and evisceration of the child was required after labour had existed eighty-four hours. Two weeks subsequently she first observed that her urine came through the vagina, and since that period none had passed the right way. On making a careful examination, an enormous fissure was detected in the upper part of the vagina, readily admitting three fingers into the bladder, the neck of the uterus forming its upper boundary; the parts were, however, soft and healthy. The extreme size of the fistula, and the fact that the uterus formed part of its walls, were points which appeared to militate much against a successful result to any operative measures; nevertheless, upon the strong recommendation of Drs. Oldham and Hicks, I was induced to undertake the operation, with the hope that some benefit, at least, might be conferred upon the patient.

On May 8th, 1861, with the woman turned two thirds over upon her abdomen, and under the influence of chloroform, the operation was performed. A free section of the edges of the fistula was made, this part of the operation having been considerably simplified by the use of the instrument already described. Three metal sutures were inserted some lines from the margin of the wound, one of them being passed through

the neck of the uterus, and Bozeman's splint applied, a catheter was then passed, and left in the bladder, and a grain of opium ordered twice a day. Everything appeared to be going on well till the fifth day, when the patient, fancying that her bowels should be relieved, strained violently; this straining being accompanied with a gush of urine from the vagina, and expulsion of the catheter from the bladder; the latter, however, was reintroduced, and the next day the whole of the urine appeared to pass through that channel. Under these circumstances, it was not thought necessary to make any vaginal examination, fearing that such might again disturb the parts. The next night the catheter again became stopped up, and in the morning at least ten ounces of urine were drawn off. This fact was satisfactory, as it clearly indicated a complete closure of the wound. The bladder also resisted the presence of the catheter; this was accordingly removed, and the urine was ordered to be drawn off at short intervals, From this date everything went on well. On the seventh day, an elastic catheter was passed, and ten ounces of urine were withdrawn. On the twelfth day after the operation, and seventh after the expulsion of the urine through the vagina, a careful examination was made; when the splints and sutures appeared to be firmly in position, and the tissues were free from all signs of inflammation. No indications of the passage of urine through the fistula could be detected; it was, however, deemed desirable to leave things as they were for a few days longer, as only seven days had expired since the urine had passed through the fistula.

On the fourteenth day after the operation the splint was removed, and we had the satisfaction of proving that a perfect cure had been obtained. The edges were beautifully in apposition, and looked quite healthy, cicatrization being nearly complete. The bladder could retain half a pint of urine without inconvenience, and the vagina was as dry as natural. The patient remained in the hospital another fortnight, and returned home cured. She has since been heard of, and the cure was still perfect.

Case 2. *Vesico-vaginal fistula, under the care of Dr. Braxton Hicks and Mr. Bryant.*—Mary H—, æt. 23, was

admitted into Guy's Hospital on April 3rd, 1861. She was a married woman, and had given birth to five children, four of which were stillborn. The last confinement had taken place one year previously, and the presentation was a footling. Since that date her urine had passed freely from a fistulous opening in the bladder through the vagina. She had been operated on twice previously, six and three months respectively prior to her admission, by a surgeon of great skill; both operations having been spoilt by profuse secondary hæmorrhage into the bladder, and rupture of the parts. When admitted, a careful examination was made, and a fistulous opening into the bladder, large enough to admit the finger, was observed high up; the edges were healthy, but the vagina at this spot was somewhat contracted.

On May 1st, with the patient turned two thirds over on to her abdomen, and under the influence of chloroform, I freely pared the edges of the fistula, using the same instrument as a director; as in the last case, three metallic sutures were introduced, and the perforated shot splints applied; a catheter was passed and fixed in the bladder, and a grain of opium ordered to be given every six hours. Everything progressed favorably; and on the eleventh day the splints and sutures were removed, perfect cicatrization having taken place. The bladder remained somewhat irritable after this date, and continued so when the patient left the hospital on May 30th; although in this respect, under the influence of tonics, she was gradually improving. She left to go abroad with her husband, who was a soldier.

It will be observed that since the publication of the two cases just quoted, many points of practice which were then employed have been given up. The simple wire suture secured by a shot has taken the place of Bozeman's splint, and the periodical introduction of the catheter for its constant wearing. The free use of opium by the mouth has likewise been discontinued, the occasional suppository having taken its place.

Case 3.—*Vesico-vaginal fistula; operation; recovery.*—Mary C—, æt. 37, was admitted into Guy's Hospital, under my care, on September 19th, 1864, with a vesico-vaginal fistula nearly one inch in diameter. She had been sent up to me for treatment by Mr. Holman, of Uckfield, Sussex. She was a married woman, and had given birth to eleven children. In her last confinement she was delivered by means of instruments, and on that occasion the fistula was produced. It had existed for five months. The fistula was situated at the upper part of the vagina, close to the neck of the uterus; its edges were healthy, and free from cicatricial bands. The whole of the urine passed through the fistula, and the external genital organs were excoriated and inflamed from the irritation which it had produced. The woman's health was far from good. Tonics were consequently given, and perfect cleanliness observed for several weeks, under which the woman's general health much improved, and the genital organs became more healthy. On October 21st the operation was performed.

The woman was placed on a table, and turned two thirds over on her abdomen, with her pelvis well raised by pillows, the right leg being elevated and supported, the left falling over the end of the table, and likewise held. Chloroform was administered, the duck-bill speculum was next introduced, the posterior wall of the vagina held well back by means of an assistant, and the whole vagina thoroughly sponged out, a good view of the fistula being thus obtained. By means of a long scalpel the amount of mucous membrane was mapped out which it was considered requisite to remove, and the largest-sized pronged guide (No. 3) introduced; its points were inserted at the margin of the upper lip of the fistula, close to the mucous lining of the bladder, and passed carefully beneath the mucous membrane of the vagina to the line of incision as previously mapped out; the intervening tissues were then well drawn down by means of the blunt hook to the base of the pronged guide, and the whole cleanly cut off by passing the scalpel along the under surface of the transverse bar. The lower lip of the fistula was subsequently treated in the same way, when its whole margin was found to have been cleanly pared; four silver wire sutures were subsequently introduced by means of the hollow needle, and their ends permanently held and protected by the perforated shot. The bladder and vagina were washed out with cold water, and a suppository of ten grains of compound soap pill introduced into the

rectum, the woman being placed in bed, with her knees bent and legs tied together; everything went on very favorably from day to day, although the patient, who was somewhat weakened, expressed herself as suffering much. The urine was drawn off at regular intervals, and the vagina, which was free from urine, daily washed out. On the eighth day the parts, on being carefully examined, were found to be quite healthy, and to have united. The sutures were consequently removed, and in another week she was declared to be convalescent. She remained in the hospital for a short time longer, and left for her country home quite sound.

Case 4.—*Recto-vaginal fistula; operation; recovery.*—Mary P—, æt. 40, a married woman, was admitted into Guy's Hospital on May 31st, 1863, under my care and that of Dr. Oldham, with a recto-vaginal fistula of one year's standing. The opening was situated about one inch and a half up the vagina, and was nearly one inch in length; its margins were healthy, and of good consistence. The line of furrow was nearly vertical. On June 14th, the bowels having been freely opened the day previously, the operation was performed. The woman being placed on her back, with her legs drawn up and held as in the lithotomy position; chloroform was given. With the duck-bill speculum the anterior wall of the vagina was held fairly out of the way, and a good view of the fistula secured. By means of sponge and water the parts were then thoroughly cleansed, and the operation commenced. The amount of surface which was to be pared was first sketched out by a sharp-pointed bistoury, and the No. 3 B pronged guide introduced to the right margin of the fistulous opening; the half circle of integument, which it was considered right to remove, was then well pressed down to the prong's base by means of the finger and the blunt hook, and cleanly cut off by one sweep of the knife passed along the bar of the instrument; the other margin of the fistula was treated in the same way with equal facility, and the first step of the operation was satisfactorily completed. The application of a cold sponge soon stopped all bleeding, and the sutures were next introduced. These being readily applied by means of the curved mounted needle, four silver wire sutures were put in, and their

ends fastened by large perforated shot, the margins of the wound being well pressed together, these shot at the same time protecting the opposing surface of the vagina from the irritation caused by the exposed ends of metal wire. A suppository of compound soap pill was given, and the parts thoroughly cleansed with cold water, the woman being replaced in bed. It is unnecessary to give a daily account of her progress, for it was most satisfactory; the parts were all kept very clean, and the urine was drawn off at regular periods. Good diet was given, and a free use of stimulants allowed.

On the eighth day the sutures were removed, and the whole fistula was found to have been firmly united. The bowels soon acted naturally, without pain or any evil effect, and in another fortnight the patient left the hospital, in all respects a sound and healthy woman.

Case 5.—*Recto-vaginal fistula; operation; recovery.*—I was consulted by my friend Dr. George Frederick Farr, of West Square, in the case of a lady æt. 26, who was the subject of a recto-vaginal fistula, following a tedious natural labour, four and a half months previously. The fistula was situated about an inch or so up the vagina, and was about the size of a sixpence. The parts around were quite healthy. The bowels having been well cleaned out the day previously, and a simple enema given in the morning of January 16th, 1863, the operation was performed. The patient being placed fully under the influence of chloroform, the pronged guide No. 2 was employed, and the margins of the fistula readily pared in the same way as we have already described. Three silver wire sutures were introduced, and the wound well closed, the edges being firmly pressed together with the finger before covering up the parts; this provision being of value in squeezing out any small clots of blood which may be present to interfere with rapid union, and bringing the surfaces of the wound closely into apposition. The suppository, as usual, was introduced, and the patient placed in bed.

Everything went on from day to day as satisfactorily as could be wished. On the eighth day the sutures were withdrawn, good union having taken place. The bowels acted

naturally soon afterwards, and without any bad result to the parts, and convalescence speedily took place. The patient's ordinary diet was allowed from the first.

CHAPTER II.

ON THE OPERATION FOR THE RELIEF OF A LACERATED PERINÆUM AND SPHINCTER ANI, &c., WITH SOME OF ITS COMPLICATIONS.

The principles of practice which have been laid down for plastic operations in the vagina, for the relief of the vesico- or recto-vaginal fistulæ, are in a measure applicable to cases of lacerated perinæum, whether simple or complicated, for the objects of the surgeon in both classes of cases are very similar, and they are to be secured by the same ends, the means for obtaining them requiring only such modifications as the change in the situation of the parts affected necessarily demands.

The points which claim attention in this operation are not numerous, although they are most important; success being secured only by their close observance.

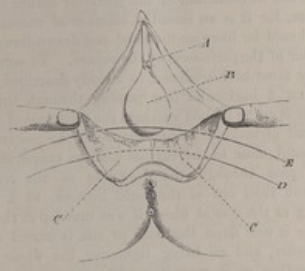
They may be described as follows:

The surgeon having carefully examined the parts, and determined the important question of how much of the lacerated perinæum requires closure, should place his patient on her back in the lithotomy position, and map out the portion of the membrane which he intends to remove, with a sharp scalpel.

He must remember, as a point of primary importance, that the surface of the wound should be *clean and regular*, for it is essential to secure primary union of the two surfaces; the new perinæum also, to be of permanent service, must be *firm, strong, and thick*; for if otherwise, the success of the case will be but partial or of little permanence.

To secure these two objects, a free and clean section of the lacerated perinæum is absolutely essential; it cannot be made

too smooth, nor can the surfaces to be placed in apposition for union be too broad posteriorly towards the rectum; at least an



A Urethra. *B* Orifice of vagina.
C Surface of perinæum, bared of its mucous covering, with the anterior border of recto-vaginal septum.
D Line of introduction of first deep suture. *E* Of second deep suture.

inch of raw surface is not too much, when it can be secured, the width of the bared surface diminishing slightly towards the anterior portion of the labia. The best plan to obtain these results is to perforate the parts towards the centre, and as it were slit them up with one sweep of a sharp scalpel; the right half of the perinæum being first treated, and the left subsequently, the whole area having been mapped out previously by a bistoury.

This *first* step of the operation having been performed, the second, which is of no less importance, remains to be carried out, and that is the bringing of the parts into apposition and keeping them there by sutures. Wire sutures are probably the best for these purposes, for if they do not cause less irritation than smooth silk they are at any rate more manageable. Each one should be inserted at least half an inch, or, better still, an inch from the margin of the wound, and brought out at its posterior border close to the vaginal mucous membrane; it should be then reintroduced at a cor-

responding point on the opposite side, and brought out at a spot similarly situated to the one at which it was introduced. When the recto-vaginal septum or sphincter ani has been lacerated, the introduction of the posterior suture is of critical importance, for it is an essential element of success that this septum should be likewise included and drawn forwards to the raw surface of the perinæum by the suture. To secure this end the suture must be introduced, as already described, at a point situated on a horizontal line passing through this septum; the needle is to be dipped well into the thickness of the tissues, and instead of making its appearance at the posterior margin of the wound, close to the vaginal mucous membrane, is to be made to pass through the thickness of the recto-vaginal septum, and then out of the right buttock, at a point corresponding to the one at which it was inserted in the left side. When this is well done the wire or silk is buried completely in the tissues, and on being tightened the whole parts are drawn together, as it were towards a centre, corresponding to the anterior portion of the anus and posterior of the perinæum. The other anterior sutures may be applied as already directed.

With respect to the necessity of dividing the sphincter ani in this operation, I will only add that I have not yet met with a case requiring such treatment.

The sutures need not be removed at too early a period, the eighth or tenth day being generally the best, but when good union has taken place, the practice of leaving them in position is certainly unnecessary, if not injurious. The *urine* should be drawn off at regular intervals, and the *bowels* kept quiet by means of opium. The ten-grain suppository of the compound soap pill, after the operation, is a valuable practice in this as in all cases of abdominal surgery, for it allays local spasms, keeps the bowels in a quiescent condition, and secures rest to the stomach, which, after chloroform, is so apt to be irritable. Perfect *cleanliness* is essential during the whole treatment of these cases; and the horizontal posture is to be maintained, the legs being tied together. The patient's diet should be liberal and much as usual.

Success in these cases depends much upon what are termed small matters, and it is of great importance to give them due

care and attention, for recovery may, as a rule, be secured in all these cases, however complicated.

I shall now proceed to quote a few cases illustrative of the practice I have laid down. They are successful examples and may be taken as types of all others.

Case 6. *Laceration of the perinæum, completely through the sphincter ani, and at least one inch of the recto-vaginal septum; operation; recovery.*—Alice H—, æt. 35, was admitted into Guy's, under Dr. Oldham's and my care, on June 3, 1863. She had been the subject of this distressing condition for eight years, the laceration having followed her first natural labour; she had had five children since, and it was believed that during the last confinement some increase of the original mischief had been sustained. Her general health was very good, and the genital organs were quite healthy.

On making a careful examination of the parts, I discovered the most severe laceration which it has fallen to my lot to witness; the vagina and rectum were literally converted into one large orifice; the sphincter had been completely torn through with the perinæum, and at least one inch of the recto-vaginal septum had been likewise divided, the mucous membrane of the rectum bulging forward into the vagina. The fæces and flatus passed without any hindrance, for no indication of control over the anal orifice existed.

I undertook the treatment of this case with considerable apprehension, for I expected that if the perinæum and anal orifice could be restored, a recto-vaginal fistula would be left, although a second operation might succeed in its ultimate occlusion.

On June 12th, 1863, I proceeded to operate, the lower bowels having been the day before completely cleared out by purgatives and enemata.

The patient having been brought under the influence of chloroform, was placed upon her back, as in the position for lithotomy, and with the scalpel the margin of the labia and perinæum, backwards to the anus, were stripped of their mucous coverings, for at least three quarters of an inch in width; the margins of the lacerated recto-vaginal septum were then pared with the transverse border of the septum. The

whole surface of the parts to be brought together were thus completely stripped of their mucous covering, and had now to be adjusted by means of sutures. Silver wire sutures were employed.

The first, the most important, was inserted at the lower part of the wound as the patient rested, and into the left buttock, at least one inch and a half from the margin of the fissure, and in a line parallel with the recto-vaginal septum, the needle was passed well into the tissue, and insinuated unseen horizontally through the transverse border of the recto-vaginal septum and up through the tissues of the right side, coming out on the right side at a spot corresponding to the point of entrance on the left; during its passage it was completely buried in the tissues; the needle and wire were then drawn through, and when the latter was tightened, the sides of the perinæum and divided border of the sphincter and anus, with the recto-vaginal septum, were well drawn up together firmly in apposition; two other sutures were introduced to bring the anterior border of the perinæum together, a suppository introduced, and the patient placed in bed. An uninterrupted progress towards recovery marked the subsequent history of this case; the wound healed most kindly; the posterior or most important suture was removed on the eighth day, and the other two on the tenth; in another day the bowels acted, and the motions passed along their natural channel; the sphincter soon showed evidence of its power by controlling the action of the bowels and retaining flatus, and in six weeks from the day of operation the patient left the hospital quite well.

Case 7. *Ruptured perinæum and sphincter ani; no control over action of the bowels; operation; recovery.*—Eliza B—, æt. 28, a married woman, the mother of four children, was admitted into Guy's, under Dr. Oldham's and my care, on May, 1863. She had been the subject of her present condition for four years, the laceration having taken place during her first confinement, which was a very tedious one.

The whole perinæum had been completely torn through, with the sphincter ani. Fæces and flatus passed without the slightest control, rendering the woman's life wretched. Her

general health was good, and altogether the case presented a very favorable prospect for operation.

On June 20th the woman was brought under the influence of chloroform, and placed upon her back in the lithotomy position; the lacerated borders of the perinæum backwards to the anus, together with its anterior lacerated margin, were then completely bared of their mucous covering, a good broad surface—varying from half to three quarters of an inch—being removed. Three silver sutures were next introduced, the posterior one being passed through the recto-vaginal septum, and all introduced at least one inch from the margin of the wound. An opiate suppository was also given.

On the ninth day the sutures were removed, good union having taken place; on the fifteenth, the bowels acted naturally, and complete control over the sphincter was rapidly regained, the woman leaving the hospital in all respects sound and well.

Case 8. *Laceration of the perinæum down to sphincter, with prolapse of the anterior wall of the vagina; operation; recovery.*—Fanny C—, æt. 33, a healthy married woman, was admitted into Mary's Ward, Guy's Hospital, under Dr. Oldham's and my care, on September 16th, 1863. She had had one child twelve years previously, and it was on that occasion her present injury was received. She had been operated upon four years afterwards by a physician-accoucheur, but without success, the union having been but partial and very thin.

On October 7th, chloroform having been given, the patient was placed on a table, on her back, with her legs flexed and raised; the sides of the perinæum were then very freely stripped of their mucous covering backwards to the sphincter, at least one inch of surface in width having been removed, and four silver sutures introduced. The vagina having been closed as completely as possible consistent with the maintenance of its natural uses, an opiate suppository was given as usual.

On the ninth day the sutures were removed, and good union had taken place. The woman remained in the hospital some little time after, and a good solid perinæum was found to have been formed. The prolapse of the vagina was cured, with all other inconveniences, the patient leaving quite well.

Case 9. — *Lacerated perinæum completely through the sphincter ani, with prolapse of the posterior wall of the vagina; operation; recovery.*—I was asked by Mr. Pocock, of Brixton, in August, 1863, to see a lady, æt. 30, who for two years had been rendered miserable by her inability to control the actions of the bowels, except when very constipated. The injury had been received during her first and only confinement; the labour having been a natural one, although very tedious.

On examining the parts, I found that a most complete laceration of the perinæum had been sustained, and that this laceration had extended through the external sphincter of the anus, the posterior wall of the vagina bulged considerably forwards, and when the patient stood it fell still more, even externally.

On August 24th, the patient's bowels having been previously thoroughly cleansed by an aperient and enema, chloroform was given, and the operation performed. The posterior borders of the perinæum were freely pared, together with the anterior margin of the anus, a piece of the mucous membrane of the posterior wall of the vagina, beginning at the sphincter, being also removed. Three silver sutures were next introduced, the posterior one the first, the wire being made, as in the other cases related, to pass through the anterior border of the recto-vaginal septum. The ends of the wires after being twisted were secured and protected by perforated shot.

On the eighth day the sutures were removed, the wound having healed kindly. The bowels subsequently acted spontaneously, and a good convalescence followed, perfect control over the action of the bowels having been secured, and the tendency to the vaginal prolapse prevented.

AMPUTATION AT THE HIP-JOINT.

BY

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AMPUTATION AT THE HIP-JOINT.

Amputations at the hip-joint are so rare, that each case, successful or unsuccessful, should be recorded. I have therefore given the following in detail, as it presents many points of interest.

As far as I can ascertain, it is the second successful case recorded in India. The first, of which I can find any notice, is that related in the Lancet, Vol. I, page 411 of 1850, by Mr. Wigstrom, of the 14th Dragoons, who operated successfully, by antero posterior flaps, in November 1849, on a patient who was suffering from diseased femur and profuse suppuration, extending nearly to the hip.

In February 1853 I also operated in a case of gun-shot wound of the head and neck of the femur, and this, though death ensued, may fairly, as far as the operation was concerned, be recorded as successful, for the patient died, not* of the operation, but of Tetanus, a month after the amputation, when the wound was all but healed.

The case I now record is interesting, not only for its own sake, as an amputation at the hip-joint, but because it was a secondary amputation following that of the thigh, and performed when the patient was very low, suffering from clear indications of blood contamination, the result of a diseased condition of the Medulla,† which is unfortunately frequent here after section of the long bones, and the cause of many unsuccessful amputations.

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* Amputated 16th February. Died of Tetanus 17th March 1853.

† Osteo Myelitis.

I have noticed this subject more at length in another communication to the "Annals," but I may here remark that the present case is a good illustration of the disease Osteo Myelitis and the constitutional and local symptoms it gives rise to, it also clearly demonstrates the advantage of amputating above the next joint to the bone affected, provided the operation be performed before the systemic poisoning have gone too far.

I regard the details of this case as so interesting, in both a surgical and pathological point of view, that I have not hesitated to give them in extenso, though, as a general rule, such prolixity is objectionable.

It is to be remarked that the operation was performed, and the recovery occurred, at a very hot season of the year, the Thermometer ranging from 86° to 104°. Cholera and other diseases very prevalent at the time.

Shekh Asghur, aged 16 years, a slight and somewhat delicate lad, a carriage driver by trade; accustomed to drink 6 or 8 ounces of Bazar spirit daily, thin, sallow-looking, and with congenital cataract in the left eye, was admitted into the Medical College Hospital on the night of the 10th April 1864, suffering from injuries sustained by a fall from a horse which trampled on, or kicked him, after he fell.

He had a wound on the chin slightly exposing the bone,* one on the lip, and some smaller ones on other parts of the body. The most severe injury was on the inner aspect of the right knee-joint, the integument being torn and bruised, the muscles and tendinous structures exposed to the extent of 3½ by 2½ inches. The joint injured, but not apparently opened, though it appeared probable that the bruised tissues would slough and open it.

* From which, subsequently, a small piece of bone exfoliated.

He had had a good deal of pain and serous discharge. Ordered cold applications and perfect rest of the limb on a splint. The other wounds were also dressed.

April 12th.—The wound again carefully examined, and through the bruised and injured tissues the joint was felt, the point of the finger passing into it; the inner condyle of the femur roughened; fluid collecting in the joint; pulse quick; no pain. In consultation with Mr. Partridge, I decided on amputation.

At 9 A. M. I removed the limb, under Chloroform, by modified circular amputation at the lower third of the thigh. All bleeding points being secured, the edges of the flaps were secured by metal sutures.

I observed that the muscles at the posterior aspect of the thigh had a bruised and discolored appearance.

April 13th. 8 A. M.—Is feverish; pulse 120°; no hemorrhage; tongue moist. Ordered cold applications to the stump, perfect quiet, diet of milk and sago.

14th.—No fever this morning. The posterior part of the stump is gangrenous to a small extent, corresponding to the discoloration of the muscles observed during the amputation.

15th.—The sutures have given way and the interior of the stump is exposed. It is somewhat sloughy in appearance; the end of the bone is denuded of periosteum and necrosed; medulla discolored at the point of section, may be living below the surface. I observed during the amputation that the periosteum and the bone were both healthy, and that the membrane adhered closely to the bone at the line of division; most of the ligatures on the smaller vessels came away to day. He had slight fever yesterday evening, but has none now; pulse 100°.

Ordered nutritious diet. Port Wine 4 ounces. Let the stump be kept washed with a weak solution of chloride of zinc.

16*th*.—Pulse 100°; tongue clean. Had no fever yesterday; took his food well; stump cleaning; gangrene not extending. Continue the treatment of yesterday.

17*th*.—Pulse 100°; stump cleaning; takes his food fairly; Bowels loose. Continue all as yesterday.

18*th*.—Pulse 100°; tongue clean; bowels regular; stump cleaning; a considerable portion of the bone, especially one side of it, denuded of periosteum. The state of the medulla is not discernible, as the end is discolored.

19*th*.—Pulse a little over 100°; soft parts of the stump look well; sloughs have separated (they were very superficial). Ligatures have all come away. On one side the periosteum is adherent almost to the end of the bone, on the other it is denuded for more than two inches; the bone is dry and I fear dead. Passed a long probe into the medulla; it entered four inches of dead and putrid tissue. I fear the shaft is diseased throughout; Osteo-myelitis from end to end.

His system is not yet much affected; no diarrhœa; tongue clean; good appetite. Pulse 106 to 108°.

20*th*.—Pulse 100°; has a peculiar thrill; stump looks clean and healthy with the dry half dead bone protruding from the centre. Has taken his food well. Continue all as usual.

21*st*.—Soft parts red and granulating, discharging healthy pus; one side of the bone covered with granulations, the other bare and dead. Bullet probe passes fully ten inches down the medulla in dead fœtid matter. At that distance it seems to be sensitive; it must be close to the epiphysis. There is a chance that Nature may limit the mischief there; but can so

large a mass of bone be thrown off? The alternative is death or amputation at the hip.

Pulse this morning is 104°; tongue clean; bowels regular; takes his food well; on the whole he does not look so bad, but there is a nasty thrill about the pulse, which is excitable and quickens easily.

22*nd*.—Pulse has risen to 120°; skin heated in evening. Continue all as usual.

23*rd*.—Pulse this morning over 130°, very excitable, quickens to 160°, and falls again, with a peculiar thrill. He has had diarrhœa since yesterday, and fever in evening; the House Surgeon gave him astringents in addition to the Port Wine.

24*th*.—Pulse over 140° this morning, and of the same character as yesterday. A probe passes down to the head of the bone and causes pain there.

He is feverish; tongue moist, but the papillæ are becoming obliterated.

The diarrhœa continues, and he has a peculiar tremor of the muscles all over the body. Sonorous rāles in the thorax, with cough, but no hepatic or abdominal tenderness.

In consultation with Professors Chevers and Partridge, I determined to amputate, either through the trochanters, or at the Hip joint, to be determined when the bone was exposed and its condition examined.

The operation was performed at 9 A. M., under chloroform administered by Mr. Hayes. The knife was entered a little above and in front of the great trochanter, it emerged at the root of the scrotum. The flap being raised, the femoral artery was tied before the posterior flap was cut; on dividing the bone at the great trochanter, drops of pus oozed out of its

cancellated tissue, I therefore seized it with the Lion forceps and dissected it out, without loss of time. The acetabulum was healthy. Tied all bleeding points, venous, and arterial. The loss of blood was very small, less than 8 ounces. His pulse, which was over 150° when the operation was commenced, was very little weaker after it was over. Gave him stimulants and applied hot bottles.

I was assisted by my friend Professor Partridge, and my House Surgeon Baboo Money Lall Dutt.

24*th*, 3½ P. M.—The House Surgeon reports that there is no bleeding; that the pulse is 132°; tongue moist. Has taken milk and sago, beef tea and wine. Has no fever; respiration easy; says that he feels easier.

25*th*, 8 P. M.—He has had only one loose stool since the operation; no hemorrhage, pulse 106°, skin hot, but moist. Thermometer in axilla 106°. Tongue moist and clean, tending to a glazy condition. No hepatic tenderness; bronchial rāles on either side. Pleuritic friction in right upper chest. He is too weak to be examined on the back. He has had beef tea, and brandy 3 measures (6 ounces) since last report. Continue all as yesterday.

26*th*, 8 A. M.—Pulse 132 to 140°; skin cool and moist. Thermometer in axilla 102°. Tongue clean, tending to dryness in the centre. He has no pain. Bowels moved once yesterday. He has taken his food well, but rejected part of it. Is cheerful and in good spirits, smoking his hookah. The stump looks very well; from the outer angle a dark watery discharge; from the rest, healthy well formed pus. Washed out the cavity from the external angle, with a weak solution of chloride of zinc.

Let him have Brandy 6 ounces and food as yesterday.

27*th*, 8 A. M.—Yesterday evening, as on other evenings, the pulse quickened to 160°, and the skin got hotter. This morning it is not so hot. The tremor of the muscles is nearly gone. Pulse 132 to 142°. Spirits good. Bowels more regular. The discharge is becoming healthier.

28*th*, 8 A. M.—Pulse 140°. Thermometer in axilla 102°; skin moist; bronchial rāles still exist; slight moist rāle in upper right chest. Bowels opened once; stump looks well; discharge purulent, but from the acetabulum it is thin and dark colored; injected it with a weak solution of chloride of zinc gr. 1 to oz. 1. One ligature came away to-day. He is to have the same diet as yesterday, and two or three raw eggs beaten up with Brandy. He is reported to have been feverish again in the evening.

29*th*.—He had slight fever after 4 P. M. yesterday until early this morning. Thermometer rose to 103° in the axilla; bowels opened once. Took his food well before the fever came on. This morning he is cool; pulse 128°. Thermometer in axilla 101°. Tongue clean, moist, and smooth; stump looks well. Discharge improving. One ligature came away. Ordered quinine gr. 2, every 4th hour. The same diet, and brandy.

30*th*, 8 A. M.—Had fever again yesterday at 4 P. M. Thermometer 103°. Could not take his food. He is better this morning; skin cool and moist. Pulse 120 to 128°; chest sounds improving; tongue clean and moist; bowels moved once; stump looks healthy. Discharge improving and pretty free; one ligature came away to-day. The same diet as yesterday. I should have noticed that he has the thorax rubbed daily with a Turpentine liniment.

May 1st, 8 A. M.—Fever came on at 2 A. M. He was well all yesterday. There is now slight heat of skin. Thermometer in axilla 102°; pulse 124°; tongue slightly dry; stump looks very well; 4 more ligatures came away to-day. Removed also one or two of the wire sutures in the flaps. Discharge healthy and not profuse; moist rāles in upper right chest; respiration more natural on left side. Bowels moved twice naturally. Takes his quinine, brandy, and food as usual. He is very cheerful, and asks to be cured quickly.

2nd, 8 A. M.—He had no fever yesterday, but the pulse quickened to 140 in the evening. Axillary temperature 103°; tongue now clean and moist; pulse 128°; thermometer 100°; skin cool; bowels have acted three times, but not loose. Has taken his food well; several ligatures came away, only two left; all the sutures remaining removed. The flaps have nearly united; slight and healthy discharge chiefly from the glenoid cavity, rather flakey at times, as though the cartilage were disintegrating. The stump is now strapped with adhesive plaster. Continue the same diet.

3rd, 8 A. M.—He had slight fever yesterday afternoon, and 3 loose stools, for which the House Surgeon gave him some chalk mixture. Looks rather low this morning; pulse 128 to 130°; skin moist with sweat. Thermometer in axilla 98°; stump not looking quite so well; granulations pale. The discharge much as usual. The two last ligatures, on femoral artery, and vein came away. There has been a change in the weather; rain has fallen and the hot dry air (Thermometer 100 to 104°) has become damp. This is probably the cause of his not being quite so well. The chest sounds are better, rāles less sonorous; moist rāle in upper right chest less crepitant.

Continue the same diet and stimulants.

Stump has all but healed, except a sinus at each side, which appear to communicate with the acetabulum, and one where the two last ligatures came away.

4th, 8 A. M.—Had no fever yesterday. Thermometer in axilla now 100°; pulse 128°; bowels moved only once; stump looks well; discharge from sinuses getting thicker.

5th, 8 A. M.—No fever yesterday. Thermometer in axilla 100°; pulse 124°; stump looks well. Took his food well yesterday. Respiratory sounds almost normal.

6th, 8 A. M.—No fever yesterday; pulse quickened in the evening; slept well; has taken his food well; pulse 128; thermometer in axilla 98°; skin moist; bowels moved twice; chest sounds improving.

7th.—Pulse 120°. It is excitable, and rises when I visit him. I believe it falls lower when he is alone. Stump looks well; discharge diminishing. The femoral artery can be felt pulsating very distinctly in the anterior flap.

8th.—Pulse 120°, but it is reported to have been down to 104°; thermometer in axilla 99°. He is gradually improving; is gaining flesh and strength. Says he feels very well. Discharge from two sinuses healthy.

9th.—Pulse has been down to 108°. Thermometer in axilla 99°. Is doing well in all respects. Bowels slightly loose; discharge very healthy.

10th.—In all respects doing well; pulse 104 to 116°; had two evacuations; eats well, and is getting stronger daily.

11th.—Had two loose evacuations; the nurse says he ate too much yesterday. Put him on sago and beef tea to-day. He looks well. Thermometer in axilla 100°; pulse 120° at 8 A. M., but it has been lower; discharge healthy, contains what appear to be fragments of exfoliating cartilage.

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12*th*.—Better to-day; discharge less. In all respects he is doing well; let him have more food to-day.

13*th*.—Doing well; pulse 96 to 120°. Thermometer in axilla 98°; bowels regular.

14*th*.—Doing well in all respects; pulse fluctuates between 96 and 120°; discharge gradually diminishing and very healthy.

15*th*.—Doing well. Thermometer in axilla 99° yesterday evening; pulse varies from 90 to 120°.

16*th*.—Doing well.

17*th*.—Ditto.

18*th*.—Wound nearly cicatrized, all but two small sinuses, the inner one discharges a small quantity of sero purulent, the outer, purulent matter.

19*th*.—Doing well.

20*th*.—Left off all dressing, except over the sinus, applied oxide of zinc powder over the cicatrix and a bandage as usual to support the stump.

21*st*.—Not quite so well. Thermometer in axilla 100°. Discharge thinner, but he says he feels well.

22*nd*.—Yesterday his skin was rather hot. Thermometer in axilla 102°; pulse slightly quickened in the evening. In dressing the stump the House Surgeon pressed out a small collection of sero purulent matter from the inner angle. In all respects though he is doing well. This morning, on pressure, some serum exuded from the inner sinus. There is also a small quantity of pus from the inter sinus.

23*rd*.—He is doing very well. The discharge is very slight, but still there is some from either angle. Pulse, temperature, state of bowels, and appetite, all good.

24*th*.—Doing well. In the centre of the cicatrix there are two small patches of greyish deposit of lymph.

26*th*.—Doing well. Discharge continues as before from the inner angle, it is a mere weeping of serous fluid; from the outer a few drops of healthy pus exude on pressure. The cicatrix looks somewhat œdematous and the grey patches are still there, as though some slight source of irritation lay beneath.

30*th*.—Slight discharge from the sinuses. He is gaining strength rapidly; has a good appetite. Takes his food well, and still has his two measures of brandy. He has also begun to take and retain Cod Liver Oil; he had attempted it once or twice before, but as it caused sickness it was discontinued. He is getting quite stout, is very cheerful, sits up in his bed, and with support moves about the ward.

31*st*.—Is very well this morning, and was supported about the ward as he took a little exercise. There is still a small quantity of pus to be pressed from the outer angle of the wound. The inner sinus has closed, and the two grey patches on the cicatrix are nearly gone. The cicatrix also is less œdematous, since a small quantity of pus was pressed out from under one of the grey patches.

June 4*th*.—The sinus is nearly closed, a few drops of healthy pus exude on pressure. He is in very good health; eats and sleeps well; is gaining flesh rapidly, and walks about the ward on crutches. He takes 4 ounces of Cod Liver Oil daily, and full diet.

June 10*th*.—He is in good health and spirits; is able to walk about the hospital on his crutches and is getting stouter and stronger daily.

There is still one sinus at the outer angle of the cicatrix, from which a small quantity of purulent discharge can be pressed. The rest of the stump is perfectly healed. He went out and had his photograph taken a few days ago.

June 11th.—He has been eating sweetmeats brought in by his friends, and has diarrhœa in consequence. Ordered Ol, Ricini 3vi statim, chalk mixture after it. Put him on arrowroot and soup, and keep all his friends away. The discharge has somewhat increased, the cicatrix become œdematous, and the mouth of the sinus ulcerated to the size of a *4d.* piece. He is in capital spirits, and very anxious to be about on his crutches.

June 12th.—He is better to-day; bowels natural; good appetite; sinus contracting; discharge less. Let him have more to eat again.

June 18th.—He is in excellent health; appetite good; bowels regular; sleep sound. The sinus is still discharging, but less than it has done. The cicatrix still somewhat œdematous, but contracting daily. He was present, and walked about the room on his crutches at the last meeting of the Medical Society.

June 22nd.—He is getting fatter and stronger daily; goes about the hostipal on his crutches. Still the sinus is open, discharging a few drops of pus daily.

June 29th.—For the last day or two the discharge has been slightly increased, and this morning I find that he has had slight fever yesterday, and that there is a collection of pus at the inner angle of the stump. This I opened and gave exit to about 2 ozs. of pus. He is pretty well in other respects. Passed a probe into the sinus, but can detect no extraneous substance.

June 30th.—No fever, no pain; discharge less.

July 1st.—Doing very well; scarcely any discharge; no fever, no pain. In excellent spirits and good appetite. He has gained much in flesh.

July 5th.—Sinus almost closed. He is in capital health, not the slightest pain or tenderness in the stump. The cicatrix contracted almost to a line. He is placed under the hospital Durzee, and is learning to make himself useful as a tailor.

July 8th.—A few drops of pus can still be squeezed out of the sinus, but there is no pain. He is in excellent health and getting fat.

He may fairly be returned as cured, for his health, spirits, and appetite are excellent; he goes to his work with the hospital Durzee daily.

The stump is free from pain or tenderness, the cicatrix is contracted to a narrow line, and the sinus, out of which a few drops of discharge can be squeezed in the morning, is not larger than an ordinary probe.

A few days after the last report on the 8th July, the sinus completely closed, and he is now, on the 31st July, perfectly cured. The sinus closed, the cicatrix firm and contracted, the stump well formed. He goes to work regularly as a tailor, and is in robust health. He uses crutches and gets over the ground rapidly; is getting fat, and is much grown in height as well as circumference since his accident.

He was admitted on 10th April 1864.
Thigh amputated on 12th April 1864.
Hip amputated on 24th April 1864.
Perfectly cured on 31st July 1864.
Just 100 days from the operation.

SURGERY IN BENGAL:

AN ADDRESS TO THE BENGAL BRANCH OF THE BRITISH MEDICAL ASSOCIATION.

BY J. FAYRER, M. D., F. R. S. E., & F. R. C. S. E.,

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SURGEON, BENGAL ARMY.

AT THE ANNUAL MEETING, 14TH FEBRUARY 1865,

CALCUTTA.

Mr. President and Gentlemen—I know not how I can better fulfil the duty which has been assigned to me, of giving the first address in Surgery to the Bengal Branch of the British Medical Association, than by endeavouring to say something on the state of that Department of Medical Science as it exists on this side of India in the present day. I therefore propose to notice briefly the subject of Surgery in India, adverting specially to such points as appear to be of peculiar interest.

I confess that, in making this proposition, I undertake a matter which I feel fully conscious I am inadequate to do justice to, did even the time itself admit of the comprehensive consideration of so large a question. Yet, I trust I shall be able to show that Surgery and Surgical Pathology have not suffered in the hands of Indian Surgeons.

It is true that, as the labours of our profession lie scattered over a wide extent of country, much of what is done is known but to Official Records, or appreciated only by those who have reaped the benefits these labours have conferred. But it cannot be that such large experiences are always to remain unnoticed, or lie buried among the records of the past. In the present enlightened and advancing state of pathological enquiry, they must be made contributive to that progressive

knowledge, of which I would fain hope to see this Association the exponent.

It appears to me remarkable how little the subject of Surgery in India has attracted attention in the West, how little seems to have been drawn from a mine so rich in produce. This may be, no doubt, to a great extent attributed to the isolated and scattered position of the medical men in this great country, and to the paucity of Indian Journals on Medical Science in which they might make their labours known. But yet no one can turn to the pages of the Journal of the late Medical and Physical Society of Bengal, the "Pathologia Indica" of the late lamented Allan Webb, or the works of Brett, Martin, Twining, Chevers, Morehead, Carter, and others, as well as to the "Indian Annals of Medical Science," or the Journals of Madras and Bombay, without being convinced that India has fairly contributed its share to the Annals of Surgery and Pathology.

And this, indeed, is not more than should be expected; for to few have been given the like opportunities of dealing with disease, surgical or medical, on so large a scale, as to the British Surgeons who have spent their best years and energies in India, or to those native gentlemen who have so thoroughly grasped the Science of Medicine, as it is taught in Europe, and who have learned to practise with success the boldest operations in surgery.

Isolated, cut off from professional communion with his fellows, deprived of that stimulus of contact and intercourse, which is so essential to the growth of scientific knowledge, especially in a profession like ours, where so much depends on observation and interchange of our ideas with those of others, no wonder if the young surgeon, in the midst of a large experience, should have failed sometimes to profit to the fullest extent by his great advantages; to the extent, that is to say, he would have done, had he been in a position to talk over his cases and compare his ideas with those of his professional brethren.

Such is but too frequently the case with both Native and European Surgeon in the Mofussil of India, and such, no doubt, is the reason why so little is known of his work. And still much has been done, and is doing, as I hope to show; and had my address no other result than that of directing attention to this subject, I should think it had fulfilled a good purpose.

By the kindness of the Medical Authorities I have been enabled to collect some interesting matter in a statistical form, illustrative of the extent to which Surgery is practised in India; and I feel sure that, whether for the amount of suffering relieved, or the extent of valuable information contributed to science, you will agree with me that it is not less interesting than valuable, and that it is, moreover, highly suggestive of the vast acquisitions that might be made to our Pathological and Surgical knowledge, were the details more thoroughly known, and the records of many years analysed.

Most of my hearers, I suppose, are familiar with the standard works of Europe, at all events of Britain, on Surgery; most of them, no doubt, are acquainted with the writings of modern Surgeons and Pathologists, on the more interesting subjects connected with those Sciences; and yet I will venture to say that you would have difficulty in adducing even a casual reference, in any of the standard works professing to treat exhaustively of their respective subjects, to the authority, practice, or opinion of one Indian Surgeon.

Let us take the operation of lithotomy, for example. The most elaborate description of all points, pathological, anatomical, chemical, or surgical, concerned in the disease for which this operation is performed; the fullest details, statistical and descriptive, of the proceedings and opinions of British and Continental Surgeons of eminence, who have been interested in, or distinguished for, their investigation or skill in operating for this grievous disease; every fact, in short, that could be collected, carefully collated and recorded, yet, not a word on the subject as it relates to India, where we count our operations by hundreds, I may say, and where some of our graduates have cut as many men successfully for stone as the greatest lithotomists Europe ever saw.

Let me not be charged with exaggeration; I may refer to my friend Baboo Ram Narain's experience, who, within a period of 12 years, in the Stations of Cawnpore and Budaôn, operated upwards of 200 times with a loss of 7 cases. Or,

as an equally good illustration of the opportunities afforded, and the mode in which they are taken advantage of, I might adduce a recent donation of 17 large vesical calculi, presented to the College Museum by a graduate whose degree is not yet a year old, removed by him, at the station of Pind Dadun Khan, within six months after joining his appointment.

And I might refer to the names of O'Shaughnessy, Brett, Webb, Playfair, Naismith, Aitcheson, Partridge, Cayley and others, as of Surgeons who have had experience in this operation, that scarcely the Frére Jaques, Rau, or Cheselden ever exceeded.

If you will bear in mind the details I give you from the Official Records, you will see that though little may have been said on the subject, much really has been done. And as in the case of lithotomy, so it is in other matters surgical; the scrotal tumours, for example, of which the Hospitals in Lower Bengal record operations by the score. Tumours of vast magnitude removed with safety and celerity in a few minutes, the important parts involved being preserved and uninjured—a strange contrast to the descriptions still to be read in standard works on Surgery, of protracted and dangerous operations, involving, not only loss of parts, but sometimes of life. Though here I should remark, the operation has been recently performed by a Surgeon in England in the method recommended by Indian Surgeons, among the earliest of whom was, I believe, the late Surgeon Brett.

Now, it is not for the purpose of animadverting on others that I say this, for to do so would be unjust; but rather to put it before you how desirable it is that we should assert for ourselves a more prominent position in the published records of our science and give our experiences to the world.

It is to a Society like that I am now addressing, that we should look for the removal of this reflection on our professional zeal; it is here, or in the pages of the Journal which I hope ere long will be published, that we may hope to hear, or read, valuable matter discussed, and thus preserved from oblivion. To me, the interest and importance of this Society have always presented themselves from the highest point of view, and I most earnestly call upon our native professional brethren to give it their support, not only by their subscriptions and presence at the meetings, but by the contribution

and free discussion of their experiences. The Association is interesting to us all, but, if any thing, it should be of surpassing interest to them, as an indication of rapidly advancing enlightenment, a prominent bulwark against traditional superstition and ignorance. I most sincerely trust that it will become a worthy rival of its sister branches in Europe, and that in all matters pertaining to Indian Medicine, Surgery, Pathology, and Sanitation, its voice may be heard and respectfully regarded.

Before alluding to the present state of Surgical Science, it is right to refer to what it was, say less than half a century ago. Of this an admirable picture has been given by Dr. Chuckerbutty in his address to the Association last year. He says, "such was the state of the Medical profession immediately prior to the foundation of the Calcutta Medical College. The Native members of it were all unqualified men, totally ignorant of the modern sciences, and, if learned at all, it was merely in the ancient lore of the Hindu and Mahomedan schools, which taught no human anatomy, physiology, or chemistry, and were replete with errors and fanciful views of all kinds in their pathology and therapeutics. The European members of it almost all belonged to the Government service, and wrote and spoke in a foreign tongue, which, from the number of technical terms they made use of, presented formidable difficulties to all uninstructed persons." And to this I would refer you, for it shows plainly the rapid strides that have been made during the past thirty years, or, I may say, since the foundation of the Medical College, an Institution which has, I believe, done more real good, and more truly advanced the interests of the people generally, than any other branch of secular education that we have introduced. And yet it is not more due to the devotion and energy of the British Surgeons who originated and developed the School and Medical education to what we now see them, than to the enlightened native gentlemen who have had the courage and good sense to avail themselves of the intellectual benefits thereby offered, that the present widely spread knowledge of medicine and surgery has been attained. Much has been, and, as I believe, much is being done towards further progress; and I trust the time is not far distant when we shall see the results in the productions of original thought and research.

Previous to the foundation of the Medical College in 1833 by Lord W. Bentinck, many distinguished British Surgeons had lived and practised in Bengal. As to their names, or the influence that our profession has exercised, from the earliest periods of our connection with India, it is not my duty now to speak, yet we can hardly pass in silence the memorable, though I fear but too little known names of Broughton and Hamilton, to whom, indeed, we may say it is due that we have ever been here at all to spread the knowledge of European Surgery in India. It is rather to that period I would refer which dates from 10th January 1836, when the learned Pundit Moodhoosudhun Goopto, who taught medicine in Sanskrit in the Hindoo College, laying aside the prejudices of caste, and snapping by one bold stroke the bonds of superstition, dissected for the first time the human body with his own hands, and thus laid among his countrymen the foundation of that knowledge of anatomy which is so essential to the Surgeon.

We can scarcely now estimate how much is due to this gentleman's courage and good example; but we can see in the rapid strides that have since that time been made in surgical knowledge, something of the results of a step which has been so beneficial to its progress, that in little more than thirty years, Calcutta boasts of an Anatomical School, which may be rivalled, but is scarcely excelled, in Europe. When I say that 1,200 bodies were dissected in the past year in the College, where, thirty years ago, dissection was unknown, I say enough to speak volumes as to the spread of anatomical and surgical knowledge. It is at the same time subject for regret that recent alterations in Municipal laws as to the disposal of the dead threaten serious hindrance to the Anatomical School, by interfering with the supply of subjects. This, I hope, is only of a temporary nature, the attention of the authorities competent to deal with the subject, having, I believe, been directed to it.

Since that date the Medical College has contributed steadily every year to the number of qualified Surgeons practising in India, and spreading the benefits of rational medicine to the most remote parts of the Indian Empire. It's graduates, or those of the University, are found now in all parts of India, practising, not in an antiquated or obsolete

fashion, but up to the most recent state of European knowledge, and with an intelligent appreciation of the rapid strides that are daily being made in pathology and therapeutics: holding the responsible charges of civil stations and dispensaries, performing the most difficult and dangerous operations of surgery, with success that tells of the care with which they have fitted themselves for the duty. And it is to be borne in mind that each of these Surgeons, whether he be European or Asiatic, in addition to the duties of his Civil Hospital and Dispensary, commands by his private practice an influence on a large circle of the native community, so extensive indeed, that, in the remotest parts of the least inhabited provinces, European Surgery is respected as something, at all events, to resort to in cases of difficulty and danger. And in many parts of the country it has so thoroughly gained the confidence of the population, that they throng to the Medical Officer for advice and assistance. Different localities, according to the province in which they are situated, have acquired notoriety for special forms of surgical disease. What Elephantiasis is among the rice-eating population of damp Lower Bengal, Calculus is to the wheat-eating inhabitants of the dry north-west; and the extent to which these diseases are cured or alleviated you may form some notion from the records I shall lay before you.

I have, with some labour, made out a list of 180 stations in the Bengal Presidency in which Surgeons are stationed, and though it is but an approximation to the actual state of things, yet it will serve to show to some extent how far surgical practice is known. I have not had leisure to analyse or tabulate the results of these documents very closely, but sufficiently to illustrate the operations and by them the class of cases most met with in different parts of India. You will observe that whilst some are abundant, such as lithotomy, removal of tumours, and amputations; others, such as excisions of joints, ligature of arteries, for Aneurism, are rare. It also serves to show, roughly, the mortality after operations, and, as might be expected, that it is larger in cities and great Hospitals than in the Mofussil and the smaller Hospitals.

Abstract of important Surgical Operations performed in the last six months of 1863 in 180 Hospitals or Dispensaries in the Bengal Presidency.

Provinces.	No. of Dispensaries or Hospitals.	Number treated in Dispensary or Hospital.	Amputations.	Deaths.	Lithotomy.	Deaths.	Lithotrity.	Deaths.	Ligature of Arteries.	Deaths.	Removal of Tumours.	Deaths.	Scrotal Tumours.	Deaths.	Strangulated Hernia.	Deaths.	Radical Hernia.	Deaths.	Excision of Joints.	Deaths.	Trephining.	Deaths.	Plastic Operations	Deaths.	Cancer.	Deaths	Perineal Section.	Deaths.
Bengal	54	101,746	20	3	43	4	..	..	1	..	29	..	16	..	1	..	2	1	2	1	2	1	2	..	2	..	5	2
Calcutta		165,458	32	11	25	4	..	..	1	..	113	..	29	2	7	2	5	2	1	1	1	1	2	..	2	..	11	2
North-West and Central Provinces	89	271,816	40	6	230	25	1	1	..	..	99	1	1	..	36	3	7	2	2	1	2	1	2	..	6	..	4	..
Burmah	2	1,560	1	..	1	1	..	..	..	..	2	..	..	..	..	..	..	..	1	1	..	..	..	..	2	..	1	..
Punjab	35	110,316	22	6	234	31	..	..	..	..	31	..	..	..	2	..	..	..	1	1	1	1	1	..	4	..	2	..
		383,605	65	12	555	57	1	1	1	..	133	..	1	..	8	..	2	..	5	1	1	..	5	..	8	..	5	..
Grand Total ..	180	656,865	118	26	623	65	1	1	1	..	285	..	46	2	10	2	9	3	7	2	5	2	8	..	14	..	17	2

The causes of increased mortality after surgical operations are a matter of the greatest interest, and one that might profitably be made the subject of a lecture; but I propose now to consider only one of these (an important one), as the limits of this address do not admit of more.

Let me now ask your attention to some of these details. The statistics that I refer to are of the 2nd half of 1863, and the information has been collected from the official Returns of the various stations which have been placed at my disposal by the kindness of Mr. H. Macpherson. I do not profess to have made a complete record of all that has occurred, but enough to give an approximative idea of the extent and nature of the work done. In many of the stations the Surgeons are graduates of this College and natives of Bengal,—a glance at the table will thus show how widely spread our graduates are over India.

I have in the first place a list of 180 stations and their Hospitals or Dispensaries, with the number and nature of certain of the principal operations performed in each. In the second I have a *resumé* of the whole, an abstract vide Table in page 8, which shows, among other things, how largely the operation of lithotomy prevails in the Punjab and North-West, as contrasted with Bengal.

Thus, in Bengal, there were sixty-eight cases of lithotomy with eight deaths, or one death in 8·5 cases.

In the North-West and Punjab, five hundred and fifty-five cases with fifty-seven deaths, or one death in 9·9.

In Bengal forty-six cases of scrotal tumour with two deaths.

In the North-West and Punjab only one case of ditto, and that recovered.

I have not attempted,—for, indeed I have not had leisure to do so,—to gather from these returns the details of the operations they record. That is to say, I have not tabulated the precise nature, variety, locality of each operation, or what great master's proceedings have in individual cases been followed. I have merely recorded a general account of the great operations *en masse*, and it would be a matter of no small interest to compare the record with similar ones from European Hos-

pitals, and to trace out the causes of greater or less mortality or success. However such comparison might result, one thing is sure, that we have a mass of facts to deal with—the subject of much profitable study.

Before I speak of the special subject to which I desire to direct your attention this evening, I wish, as it has an important bearing on the matter, to make a few remarks on the Hospitals themselves.

I fear it is not in my power to say anything that can be considered encouraging on this subject. The Hospitals of Calcutta were built before Hospital construction had received the scientific consideration to which it has been deemed entitled of late years; and though we have more than one noble Institution, we cannot strictly be said to have really one good Hospital.

The "Chandney" Hospital, situated in the most crowded, and probably unhealthy centre of the city, is a low one-storied building, on the ground floor, capable of containing a large number of patients; but it is ill-constructed, shut in by surrounding buildings, and imperfectly ventilated, for such must be the case with buildings constructed on the plan of this Hospital, where the wards intercommunicate, and where the inner atmosphere of the building is common to each. Such an arrangement is altogether at variance with the modern idea of the ward unit, which should contain only a limited number of patients, be isolated, and thoroughly aired by cross ventilation. The recent addition of an upper-storied building, the dwelling house of former Surgeons of the Hospital, in which traumatic and other cases of importance are placed, and where operations of magnitude are performed, has, I am told, diminished the death rate, and rendered success more frequent than formerly.

The Returns of other years, I have been informed, indicate gangrene as the most frequent cause of death after surgical operations and accidents in this Hospital, and very discouraging and disheartening it must have been to the Surgeons who have had charge of the Institution to see their best efforts frustrated by this pest of Hospitals, this plague which owes its existence to, what, I believe, we must confess, though it be to our discredit, are removable causes.

But, with all its defects, this Hospital must ever be regarded with the greatest interest, for it has long and justly enjoyed the reputation of being the Surgical Hospital of Calcutta, and it has been the scene of some of the greatest surgical triumphs achieved by our best Surgeons (such as Martin and Webb) in India.

The General Hospital, vastly better situated and possessing many advantages over the "Chandney," both in construction and locality, is utterly defective in structure, and wanting in what, in these days, are justly regarded as essentials in Hospital arrangement and construction. Perhaps more as a Medical than as a Surgical Hospital has this excellent Institution been distinguished; but it is worthy of remark that here the first operations for the radical cure of Inguinal Hernia were performed in 1856, according to Gerdy's method, by the late Mr. Bedford, and in 1859 according to Wützer's plan, by Mr. Scriven, the present Professor of Surgery in Lahore. Here, also, within the last few years, the external Iliac artery was tied by Dr. Brougham; the same operation, I might remark, having also been performed with permanent success in the Chandney Hospital about the same period by the late Surgeon Allan Webb.

It does not come within the scope of my subject to describe the labours of the many distinguished Medical Officers who have been attached to this Hospital and left their contributions to Indian Pathology as a guide to those who have come after them; but we can hardly mention the General Hospital without recalling the names of Twining, Macpherson, and Hare.

As to our own magnificent building, the Medical College Hospital, so grand as a work of architecture, and yet so defective as a Hospital, what can I say more than that, whilst in some respects it is equal to the first, in others it is defective with the worst Hospitals in Europe!

It would ill become me to judge this noble building or criticize the designs of its spirited founders by the standard of recent Hospital architectural design. It was constructed with the greatest liberality and with every attention to solidity, goodness, and comfort. Its magnificent wards or halls, the spacious dispensary and operating theatre, indicate that the

important consideration of ventilation and abundance of cubic space were fully considered, at the same time that architectural beauty was not forgotten. But I confess, with all respect for its designers, that it is difficult to understand how it escaped, if it did escape their notice, that the wards would be ventilated from end to end, and that thus the miasm of the patients at one end must be blown, according to the prevailing winds, down to the patients at the other *(vicesque acquirit eundo)*. Nor is this objection a fanciful one, or merely of theory. I am quite aware that many degrees of departure from the ideal of perfection may be admitted, and yet, practically, a good and healthy Hospital may result. But I cannot say that it has been so here; I and my colleagues know that it is not, and that this is one of the causes of increased mortality which, I am happy to say, has been somewhat abated since the council-room, a large ward with cross ventilation, has been converted into a surgical ward.

Moreover, the intercommunication of the wards, as is the case in the arrangement of this Hospital, where they all open into one another by arched spaces, though admirably adapted for the Halls of a college, library, or public institute, is not so well adapted for the treatment of the sick, who are thus rendered incapable of segregation or classification. It cannot be expected, under these circumstances, that the standard of success should be very high, where the emanations of Fever, Bowel-complaints, Pyæmia, &c., &c., commingle and diffuse themselves throughout the common atmosphere. The presence, too, of Lying-in-Wards within the walls of the Institution is at variance with the existing views of Hospital hygiene, and, if I may say so, suggests the expediency of removing this very preventible cause of disease, and the advantage that would result from devoting the space it occupies to the reception of Surgical cases, thus effecting a more complete separation from the Medical cases, which would remain on the other side.

There are many other defects which I might notice, such as the absence of all means of classification of disease—of wards for infectious diseases, and, until lately, of accident or cholera wards, of proper reception and waiting-rooms for out-patients and those seeking admission. The want of *convenient* bath-

rooms for patients, of waiting-rooms for attendants, and of rooms for the Physicians and Surgeons for the purposes of convenience or consultation. The narrow verandahs, scarcely broad enough for two persons to pass each other, the location of Ophthalmic wards in the dark and damp ground floor, the presence of the operating theatre in the most exposed and prominent, instead of the most secluded and retired part of the Hospital, and other defects which I need not detain you to detail. All these, I say, mar the perfection of this, otherwise, noble Institution.

These defects are, to a certain extent, remediable, and already something has been done, and more is in contemplation. The time, I trust, is not far distant, when the Surgical wards will be where those now occupied by the Midwifery Department are, and that Institution will be replaced, as it most assuredly should be, by a separate and distinct one, such as the Metropolis of India might and ought to maintain. Cholera and accident wards have just been added, and the Dispensary has been removed to the ground floor, whence we hope ere long to see the Ophthalmic Department removed to take its place in a separate and appropriate building.

Defects remain which, from the construction of the building, situated as it is in a crowded part of the city, are perhaps irremediable, but still the Hospital is susceptible of considerable improvement, and though it may never reach the highest standard of perfection, its utility may be increased and its salubrity improved.

Public attention is now more directed to Hospital construction and hygiene, and defects of the class I have alluded to will doubtless receive the attention and consideration they merit. The construction of Hospitals on modern principles, with all that is most desirable for the welfare of the patients, whether Surgical or Medical, will, no doubt, be the anxious consideration of the authorities; and the marked interest evinced by Government in State Sanitation is demonstrated by the appointment of a Sanitary Commission to watch over and supervise these and kindred subjects.

With reference to the Hospitals of the Civil stations, I should like to have said something more than time will admit of. But I would especially advert to the Mitford Hospital

at Dacca as an example of progress and improvement. The premature and untimely loss of the distinguished Surgeon who so lately died there in the execution of his duty, during a cholera epidemic, to which he fell a victim, worn out by his unceasing attention to the sufferers, is fresh in our memory, and deeply and truly do we mourn in the loss of Dr. Simpson that of one of the greatest Surgeons India ever saw.

The Hospitals of the Mofussil stations generally, however defective or primitive they may be,—and doubtless they are so in the smaller stations,—yet have the great advantage of country air and freedom from the contamination of city miasmata. The Surgeons, also, have the great advantage of healthier subjects to deal with, more vigor, higher vitality—a difference just as great in India, as it is between the citizen and rustic in England. However far it may be true that the healthy, simple living native of the Mofussil is peculiarly tolerant of surgical operation and injuries, and capable of the most marvellous recoveries from severe and dangerous wounds, I must demur to the extension of this theory to the inhabitants of large cities, and Calcutta in particular. In fact, so far from being favourable subjects for surgical operations, I regard them as quite the reverse, and feel assured that, to the Surgeon who has had the opportunity of treating serious wounds or operations in the rustic native, the difference must be as remarkable as discouraging. When I say that I do not believe the Hospitals of Calcutta can record three successful cases of amputation of the thigh in as many years, I am not so much reflecting on the hygiene of the Hospitals as on the locality, and the subjects who are admitted into the Hospitals for treatment. Statistics will, I think, confirm what I say, and though it is true that Hospital construction may have something to say to this high mortality, yet I feel convinced it is due more to the people and the place than to the Hospitals. It would be a curious subject to consider and investigate why the same class of people should suffer from one form of diseases in one hospital, from others in another. Why, for example, Gangrene should have infected one, whilst Pyæmia has troubled others; such differences, no doubt, are fairly traceable to local influences, and may be due to defective sanitation, which is capable of amelioration. But that either of these forms of disease should occur at all to the extent to which

they have existed, is, in my opinion, giving all due weight to local causes, more due to the city atmosphere and the people themselves, than to any other.

This brings me to speak of certain points of interest in relation to the mortality after surgical operations, and, as my time is limited, I shall confine myself to the subject which, in this respect, has most occupied my attention, and is interesting as one of the chief sources of the Pyæmia which proves fatal to so many of our patients.

The subject that I desire to ask your attention to is one of the frequent causes of death after amputation, or other injuries, or surgical operations involving section of bone.

In illustration of this, I have noted a series of amputations that have occurred during a period of two years, in my practice in the wards of the Medical College Hospital. These amputations, thirty-two in number, were all capital operations, *i. e.*, of the upper and lower extremities, either at the joints, or through the continuity of the long bones. They were—*one of the hip, three of the thigh, ten of the leg, four of the ankle (Syme's), five at the shoulder joint, five of the arm, four of the fore-arm. Of these, thirty-two in all, three* were secondary amputations, and of the *number, fourteen lived, fifteen died. Of the deaths, nine resulted* from Pyæmia, the consequence of Osteo-Myelitis, *three from Pyæmia* not depending on bone disease. There were *six deaths* from other causes, such as Tetanus, Gangrene, Exhaustion. Now it will be at once recognized that this proportion of deaths from Pyæmia, depending on bone disease, is something unusual—something very different to the ordinary death Returns of other hospitals. It is this, therefore, that I wish specially to call your attention to, not only in regard to its pathology, but with respect to the treatment, which involves a question of amputation of much importance.

The subject of acute suppuration in bone is one which has, apparently, not attracted much attention hitherto in this country, nor, indeed, has it been, so far as I am aware, so much studied anywhere as by the French Surgeons, who have given it the name of *Osteo-Myelite*, by which we also now distinguish it. M. Jules Roux, Surgeon in Chief of the Great Naval Hospital of St. Maundrier in Toulon is the

authority to whom we are indebted for the most elaborate account of this important subject in both its pathological and surgical bearings. His experience was chiefly gained in the treatment of the wounded of the French-Italian war, who were sent to Toulon for treatment—all, consequently, cases of disease or injury of some standing; and the results of his observation and treatment are interesting in the highest degree: for they not only establish the recognition of the disease as a formidable result of operations on bone and of injuries, such as those inflicted by gun-shot wounds in bone, but they point to the necessity of thoroughly re-considering the question of amputation, and fully, in my opinion, tend to confirm the view that the site of the amputation has, not less than the time at which it is performed, much to say to the mortality.

M. Legouest tells us that at the Hospital of Dolma Batchè in Constantinople, out of 639 cases of amputation, M. Salleron lost 224, or little less than one-fourth. The amputations in the continuity of the bone were 490, resulting in 192 deaths from purulent infection of 1 in 21·2. The disarticulations, in number 149, resulted in 32 deaths, or 1 in 42·3.

M. J. Roux records, in his practice in St. Maundrièr, the following remarkable success in the treatment of serious cases of gun-shot injuries requiring amputation, all being secondary amputations.

4	Hip-joint	...	successful
13	Shoulder „	...	ditto
1	Knee „	...	ditto
3	Ankle „	...	ditto
1	Metacarpo Phalangial		ditto

A series of 22 successful disarticulations, 20 of which followed gun-shot injuries of bones.

Now it is perfectly clear that this extraordinary success is due to something more than the skill of the Surgeon, the advantages of the Hospital, or other local conditions in which the patients were placed; and I think the evidence is strongly in favour of the fact that disarticulation is frequently a safer method of amputation than section of the injured bone, and also, that in cases where the bone is affected from local endemic causes, it is a clear indication that removal of the bone so diseased is desirable—That, after amputations, they have this

tendency, in certain cases, to become diseased, there can be no doubt, and, in certain places, and under certain conditions, this tendency is more strongly marked than in others. It has long forced itself upon my attention in this Hospital as one of the most frequent sources of purulent infection and consequent mortality from which we suffer.

I would be understood that it is not to the *disarticulation*, as such, that I attribute the success in all cases, nor do I urge the operation always in preference to section of the bone of the next segment of the limb. In the cases of the hip and shoulder, disarticulation, of course, alone is practicable; whereas in the leg and fore-arm, the respective advantages of disarticulation at the elbow or knee may fairly be questioned; and I have no hesitation in saying it is my opinion that, except in cases of endemic tendency to Osteo-Myelitis, section of the Humerus or Femur, in their lower third, is as good, if not a better operation than disarticulation. The great point to be attained is removal of the whole of the suppurating bone; of course, whenever the endemic tendency to Osteo-Myelitis prevails in a Hospital, this disarticulation, though, in itself, inferior as an operation to section of the bone (according to my view in the case of the elbow and knee), would be preferred to amputation through the bone, as the fresh bone-wound might, under the endemic influence, give rise to an attack of Osteo-Myelitis.

The points of interest in M. Roux's treatment are, that by disarticulating, he anticipates the chance of Osteo-Myelitis, by not opening the cancellated tissue of the bone (in ordinary wounds); and that in cases where it has set in, he removes the source of blood contamination by the ablation of the affected bone.

I have no intention of discussing the question of the general application of the term Osteo-Myelitis in the wide sense in which it is given to the chronic form of disease by the French Surgeons, and which involve a whole series of pathological changes in bone, in which the necessity of immediate amputation, is, at all events, not concerned. But it is to the acute and diffusive, a sort of erysipelatous form, an analogue of diffuse suppuration in the areolar tissue, that I refer,—a disease, so far as I have seen it, so extensive, as regards the bone

it affects, that it causes its entire destruction, and speedily, if not removed, gives rise to that septic condition of the blood which results fatally in a large number of cases, and where, after death, the evidences of the blood-poison are seen in structural changes in the viscera of the most interesting nature. These I will presently describe. It is to this point in the pathology of the disease that I would especially call attention, for, grievous as the injury of the bone is when it becomes the seat of this acute suppuration, it is not *the mere local mischief* that one dreads, although that may cause the loss of the limb. It is the *constitutional disease* to which it gives rise, and the consequent morbid condition of the blood, which is, I believe, if once thoroughly established, and not promptly dealt with, certain to entail fatal results, that we must consider *the great source of danger*. It is, then, not only to the disease, acute suppuration in the cancellated tissue, involving the whole bone and causing its rapid disorganization, but it is also to the treatment by which I believe, if the disease be early recognized, life may be preserved, that I would call attention, and it involves a question of amputation of the greatest importance, which I think I have satisfied myself in my own experience, as well as by the results of M. Jules Roux's practice, is deserving of the consideration of every Surgeon. It is, indeed, not less than it was pronounced to be by the Baron Larrey,—"a system which, if it could be adopted without control, would be, so to speak, to revolutionize the Surgery of amputations." It is not, I need hardly say, to be adopted without control, but to be carefully considered and applied in fitting cases. It is a doctrine that will thus be the salvation of many lives which otherwise would be lost.

It appears to me that if I give a brief account of the symptoms of the disease, and the pathological phenomena both in life and after death, illustrating them by the detail of successful and fatal cases, that I shall be best disposing of the time left, for, indeed, I have already occupied you too long. I would also say something on the treatment both prophylactic and curative, endeavouring to point out the occasion when amputation is needed. I would further request your attention to the pathological changes in fatal cases, and these I have the means of illustrating to a certain extent

by drawings taken from nature, or the preparations themselves.

The symptoms of this formidable disease of the bone are local and constitutional. Obscure in the out-set, both, if looked for, are to be recognized, and it is of the utmost importance that this should be done early.

I have already said that this disease had forced itself upon my notice as a frequent source of failure *here* after surgical operations involving section of bone, amputation, &c., and it is to be understood that it is of the diffuse suppuration of the bone, I speak, and not of those partial inflammations that are included by M. J. Roux in the category of Osteo-Myelitis, and which gave rise to the following remark from the Baron Larrey,—"I would ask M. Roux if the Osteo-Myelitis which complicates a fracture, interfering with union by hindering consolidation, is also the Osteo-Myelitis which prepares the callus, saving the life and limb of that patient?" For in that case there would be two very different kinds of Osteo-Myelitis, the one absolutely morbid, entirely pathological, the other essentially curative and salutary. But where would be the limit between the two?

The endemic prevalence of the form of Osteo-Myelitis is, no doubt, due to a combination of causes existing in the people, the place and the Hospital, and though, no doubt, the hygienic condition of all these are important, yet I believe that, so far as the Hospitals themselves are concerned, we are liable to err in attributing too much to their defects; for, as I have before remarked, though far from perfect, they are infinitely better than many where it is never pretended that Pyæmia results from defective hygiene.

Osteo-Myelitis may have its origin in any wound, injury, contusion of the bone, or of its periosteum, or medullary membrane; sudden extremes of heat or cold, constitutional vice, such as syphilitic or strumous deposits in bone, necrosis of the exterior extending inwards, and so causing mischief there.

I would repeat that I am alluding now only to the acute form of the disease. The suppuration that invades the entire medulla of the bone. Why it should occur in some, and not in others, or why it should occur, when the healthy condition and vigorous granulation of the soft parts of the same limb, or

of other wounds treated in the same wards and under similar local influences, indicate that the hygienic conditions, *generally*, are favourable, I am unable to say, or why the vascular highly-organized tissue of the medulla, and the cancellated portions of the bone, should take on this diseased action, and rapidly degenerate into a putrid mass of pus and caries, whilst the muscles and other tissues that were divided at the same time, are still healthy, and the general health of the patient and those about him is good (until compromised by blood contamination), I know not; but I have frequently seen that such is the case, and I have frequently detected at the bottom of a sinus in the otherwise healthy stump, dead bone, which, when exposed, presented not only necrosis of the surface, but also death of the medulla, which, if not speedily removed, would have been, and in some cases has been, the cause of death.

The symptoms of this formidable disease are, in the outset, said to be obscure. The local symptoms, no doubt, may be so, where the affected bone is unexposed or undivided. The constitutional symptoms are those of Pyæmia, and, at the outset, may be mistaken for a mere access of fever, a rigor such as may follow any great surgical operation, or may occur from other causes. But as the local and constitutional symptoms progress, the doubt is soon cleared up. The symptoms, in the acute form, generally make their appearance early, within a week or ten days, it may be earlier, after the operation, wound, or injury. The stump, wound, or contusion, may have been doing well. It may, perhaps, have sloughed a little, and the sloughs have cleared away, healthy granulations having appeared. The flaps may have united, almost by first intention (this is a point to which Sedillot directs attention as a thing to be avoided), or all but at a point or two, whence discharge continues. The pain is not necessarily acute, and the tenderness on pressure of the stump is but slightly increased. The discharge becomes more profuse, but it is not healthy well-elaborated pus. A probe being introduced, the bone is found dry and denuded, and, if exposed, the medulla will probably be found protruding like a fungus whilst the periosteum is stripped from the end of the bone. With all this there may have been only a quickened pulse, a febrile condition at some

time of the day; the temperature, at others, being at, or even below, the natural standard; rigors, as yet, so slight as hardly to have attracted attention, may have occurred. Such are the early stage and symptoms, local and constitutional. These rapidly progress and develop themselves in the most marked manner, and it is here that the critical period has arrived when it is necessary to make a thorough examination, and decide the question whether it be Osteo-Myelitis or not. Exploration should be made with the finger, the stump, if necessary, being sufficiently re-opened to admit of your doing so, and the condition of the bone should be most carefully examined and ascertained. In incipient cases, the medulla will be found protruding like a fungus, and the bone surrounding it exposed to a greater or lesser extent. At a later period, the end of the medulla is found already dead, blackened, and encrusted, but within it is a putrid mass of bone *debris*, and pus—a probe passing down the entire length of the shaft. In the former stage you can wait and watch progress, the mischief may be limited, and a ring of bone be thrown off. But in the latter case, immediate interference is necessary, and nothing less than amputation, either at or above the next joint, will suffice. The constitutional symptoms will also have indicated the necessity for interference, and they are the symptoms of Pyæmia of a marked character. Rigors, followed by fever and profuse sweatings, rapid and feeble pulse, a yellow or muddy tinge of the skin and eyes, short and hurried respiration, tongue sometimes dry and coated, at others clean, but smooth and stripped of the epithelum; Sudamina on the trunk; pain in the thorax, abdomen (hypochondria), or in the vicinity of the large joints; expectoration, not unlike that of pneumonia; constipation at first, but ultimately diarrhœa and a tympanitic state of the abdomen, whilst at the same time, a peculiar mouse-like odour is given off from the body. As the disease advances, the rigors become more frequent, the patient wanders, and he passes into a typhoid condition; sometimes life passes away gently or in the low muttering of typhoid; in others, violent delirium precedes it, though, for the most part, death occurs quietly as from extreme exhaustion.

The Hypochondriac tenderness and hurried breathing with friction sounds or bronchial râles, are the physical signs that

indicate the important changes taking place; though, I must confess, that I have occasionally in the worst cases failed to detect any one of these.

The pathological changes found after death are very interesting, and are described in the *post mortem* of a fatal case, I will presently relate. The changes in the urine during the disease are also worthy of note; though on this part of the pathology more information is needed. I have the notes of the state of the urine for some days during the life of one patient, for which I am indebted to Baboo Kany Lall Dey.

The sp. gr. varied from 1004 to 1015, the re-action generally alkaline; urates increased.

Traces of albumen and granular casts at times.

And an excessive amount of chlorides, from ·4 to 2·4 in an ounce; and of sulphuric acid, from ·446 to 1·031 in an ounce.

The treatment.—Prevention here is indeed better than cure. The former *may* be accomplished; the latter, when the disease has thoroughly established itself, is, to say the least, very rare.

The preventive measures are all such as are included in the great questions of Hospital hygiene,—free ventilation, good food, and segregation of patients. Osteo-Myelitis occurs no doubt, like other diseases of the same genus, more readily where numbers are crowded together, and where the ventilation and other sanitary arrangements are also defective. The disease is also at times epidemic; It has visited Hospitals for a time and passed away, like erysipelas or gangrene, as was the case in the Hotel Dieu in 1814, where it caused great mortality after amputations. It is more or less endemic, as in our own Hospital, and how far it is due here to insanitation I am not prepared to offer an opinion, but I have already said that I think it is at least as much due to the people as to the Hospital, and I can say that no efforts have been spared to remove all local causes of disease.

Wherever sanitary arrangements are good, with pure air, good food, space large, and, above all, where the patients are not overcrowded, the conditions exist which are unfavorable to the occurrence of the disease.

As to treatment, the earlier the disease is recognized, the more likely is any treatment to be successful.

When the pulse quickens, and rigors occur, when the discharge begins to assume an ichorous and unhealthy character; when, on examination, the bone proves to be denuded of periosteum and the medullary cavity filled with dead bone and pus, I am satisfied that the sooner amputation at, or above, the next joint is had recourse to, the better is the chance of saving the patient's life. The danger is of waiting too long, long enough for the blood poison, or the capillary embolism, to have brought about changes in the viscera, which are the precursors, if not the cause, of death.

On the earliest appearance of these symptoms after an amputation or injury of bone, the sooner the bone is thoroughly examined the better, and the conditions I have described being detected, the sooner amputation at or above the next joint follows, the better also.

As to the use of internal remedies I have little to say, none, so far as my experience goes, have any effect. The Tinc. Ferri Sesquichloridi, Port Wine, Quinine, and, according to Polli, the Sulphites, have been freely used; but to none of them have I been able to ascribe any curative effect. Beyond supporting the strength, removing the source of the toxæmia by amputation or excision of the bone, and the administration of preparations of iron with stimulants, I know of no hope or chance of saving life; and when the lungs or liver have become affected, it is indeed small.

I cannot say recovery is impossible, for, indeed, if the symptoms be early observed, and prompt measures had recourse to, before the blood-poisoning have advanced too far, I believe it may and does occur; and the case I shall relate to you, in which recovery followed secondary amputation, is one in point. Youth and vigorous constitution, aided by early removal of the diseased bone, no doubt, were the chief causes of recovery.

In those cases where collections of pus form external to the cavities, as in the joints,or under the superficial muscles, early evacuation of the pus and careful support by nutrients and stimulants, with change of air and other improvements in the hygienic state of the patient, may bring about recovery, but in cases of toxæmia from Osteo-Myelitis, the tendency

appears to be to cause the visceral changes I have alluded to, and not the more superficial deposits of pus.

Early amputation, or re-amputation, therefore, is the remedy which offers the best chance of success, and it should be, *not* in the continuity of the affected bone, but either at the next joint, or through the next segment of the limb.

In M. Roux's hands disarticulation has had the most marked success. It has been with him not only curative, but prophylactic. *Prophylactic*, because knowing the tendency of bone to take on this disease when its cancellated tissue is opened or injured, he avoided this by amputating at the joint.

The proper time for amputation (or removal of the affected bone) in Osteo-Myelitis is not difficult to determine, for it should be as soon as possible after having ascertained that the bone is so affected, and, as I have said, the diagnosis is made by the constitutional and local symptoms, and by passing a probe into the medulla of the bone. Should it impinge, on healthy *bleeding* medulla, near the surface you may, if the constitutional symptoms are not urgent, wait and see if nature will limit the suppuration and throw off a ring of diseased bone; such expectations are, in my experience rarely realized, and the doubt is generally resolved, not in favor of the bone. However, this is one of the nice points of discrimination in the treatment, and for which no absolute rules can be laid down. The constitutional signs, the state of the pulse, respiration, and temperature, would be important indications of the patient's condition, and they cannot be too carefully studied. A pulse exceeding 120, persistent temperature above 104, bronchial rales, hurried respiration, tenderness over the hypochondria, are symptoms that should cause the greatest anxiety on their first appearance, and very speedily decide the fate of the patient or of his limb.

I will, with your permission, read the outlines of two cases, one fatal, in which the symptoms during life and the pathological changes after death were well marked. The other successful, in which recovery took place after the symptoms of blood poisoning had supervened on Osteo-Myelitis. Amputation on the hip-joint in this case proved perfectly successful. I have had the bones in each case placed on the table for your inspection, and though the appearances are much changed by

the action of the spirit in which they have been immersed, yet they still display the changes that have taken place.

In the fatal case, it is true that disarticulation was not performed, but section of the humerus above the joint *was*. Whether disarticulation at the elbow joint would have been more successful, I cannot say; that the injury inflicted by the saw, the "traumatism," to use a French expression, was the direct exciting cause of the recurrence of the disease in the humerus, appears probable, and certainly, so far, is an argument in favor of M'Roux's theory of disarticulation.

Case 1.

A healthy young man named Hurish Chunder Sircar, aged thirty-four years, was admitted, on the 6th November 1864, with a large tumour of the lower part of the right fore-arm, about the size of a cocoanut. There was an ulcerated opening in the tumour, the result of a moxa, and from it issued a dark sanious ichor. The duration of the tumour was one year, and it was apparently Enchondromatous, and not Malignant. The glands in the axilla not enlarged, and the general health not affected.

I removed the tumour by excising it with the lower third of the ulna, on which it was situated. The muscles and tendons were turned aside, the ulnar artery was divided and ligatured, other smaller branches were also tied. The wound was stuffed with lint to prevent hœmorrhage. He did well at first, but the suppuration became very profuse and extended up the arm; his pulse began to quicken; fever came on. He was ordered good diet. The Tinct. Ferri Sesquichloridi min. xv. thrice daily. The sutures and ligatures all came away in due time, but the suppuration increased and indications of systemic affection became more marked, the bone became denuded of periosteum, and the medulla protruded in fungoid form. On the 21st of the month he had rigors, followed by profuse sweats, pulse 130; the wound itself had nearly closed, but the discharge from a counter-opening was very free. The arm was infiltrated and œdematous, the superficial veins marked by discolored lines on the limb.

It was evident, from both local and constitutional symptoms, that it was not possible to save the arm, and I accordingly amputated it high up near the shoulder joint by double flaps.

He lost about eight ounces of blood, as the vessels were all enlarged and numerous. This occurred on the 21st November. On the 23rd November it is noted that he was doing well, still rather feverish, but pulse quicker than before the operation.

26th November.—Pulse rapid, 130; cough troublesome; the stump somewhat swollen, and the discharge profuse. He has been ordered the Hyposulphite* of Soda, grs. xv, every three hours.

Last night he had a sudden and violent rigor; this was followed by sharp fever and sweating. Several ligatures have come away. He takes beef tea and port wine. I have noted that I fear the prognosis is unfavourable, and that his constitution is too far affected to justify amputation at the shoulder joint.

28th November.—"He has had repeated rigors, with rapid pulse in the intervals of the fever that followed."

Quoted from report of case.

Tremors of the muscular system, occasional cough, respiration somewhat hurried. I have no doubt changes are taking place in the viscera, but there is neither abnormal thoracic sound nor abdominal pain.

3rd December.—He is low, pulse rapid, the rigors and fever still continue, soft parts of the stump, up to this time healthy, now do not look so well. The bone, on examination, proves to be less diseased than I expected. The medulla protruding still bleeds, the periosteum is still adherent to the greater part of the end of the bone.

There is slight diarrhœa, he takes in consequence Tinct. Opii min. x, with each dose of the Hyposulphite. He is to take stimulants frequently.

4th December.—He died last night; having become, suddenly, much worse, he sunk from exhaustion.

* According to the theory of Polli, of Milan, that sulphurous acid prevents or arrests the putrefactive metamorphosis of animal tissues and fluids, and that the action of the sulphites would cause resistance to the catalytic action and operation of morbid poison, which (as in this case) would induce an unnatural rapidity of putrefaction.

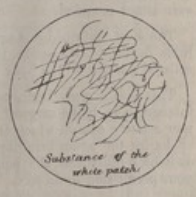
He says that the sulphites, when given internally, are absorbed, and exert their specific action upon the blood and tissues.

Vide British Medical Journal, October 1st, 1864, page 388. Mr. Spencer Well's Lecture.

Post Mortem.—*4th December*, 9 A. M.—Abdominal viscera, liver, spleen, and kidneys, healthy.

Thorax.—Pleuræ contained turbid puriform serum, anterior surface of lung quite healthy in appearance; posterior portion of lung deeply congested; the left pulmonic pleura thickened, and covered with dense deeply yellow colored lymph of a puriform appearance.

Lungs, chiefly posterior portions, full of patches of dead tissue, and in some places, where deeply congested, drops of pus oozed out on section and pressure; but these were independent of the dead patches. The lungs, *en masse*, floated in water, though the portions containing the white patches sunk. I examined them carefully under the microscope and could detect only broken down granular matter and lung tissue, (vide Sketch) *no pus*, or only a few globules, and these shrivelled and imperfectly developed. The patches to which I have referred were numerous, from the size of a pea to that of a rupee, and when cut into, presented a dead white appearance, with a fœtid sanious fluid exuding; in some there were granular cells, pus or altered white corpuscles, and round them, in certain cases, a dark areola of congested lung tissue, and in some instances, those, I presume, of longest standing, there was pus, the result of suppuration, set up by the irritation of the presence of the dead tissue, just as in the case of an ordinary boil, where the dead piece of areolar tissue (the core) is thrown off by suppuration taking place around it.



Microscopical examination of white patches in the lung of Pyæmic patient. (250 Diameters.) Pyæmia originating in Osteo-Myelitis after excision of bone and secondary amputation of the arm. Patient's name Hurrish Chunder Sircar. Died December 4th, 1864.

I have had doubts as to whether this was really a portion of dead lung tissue, or whether it was not merely a portion of lung infiltrated with aplastic exudation; whatever it may be, it certainly *is not* what it is usually called, an abscess, and this is a point in the pathology to which I particularly desire to call your attention; and if it be dead tissue, how is the death caused? Is it by capillary embolism? or how does the blood poison operate? Is it in producing inflammation, or, as I, regard it, death of the tissue previous to the inflammation, which is a consequence, not a precursor of the death?

I feel inclined to explain it by embolism in the pulmonary artereal capillaries (the microscopical emboli having arrived there through the heart), or, at all events, death is caused by some process analogous to that by which the portion of areolar tissue that forms the core of a boil is *killed* before inflammation is set up round it, to throw it off, a process which having taken place gives rise to the abscess, in the centre of which the core of the boil is formed.

The axillary vein was found filled with black jelly-like clots; near the stump a firm fibrinous clot blocked up its calibre. This clot was yellowish in color, and closely adherent to the living membrane of the vein. This was in one part red, in another pale and roughened, and the surface could be easily scraped off with the back of the scalpel. The smaller venous branches contained a puriform matter, which flowed out on pressure from the cut ends. The state of the cephalic vein is not recorded.

The *bone* contained pus up to the head, and here and there, little depôts of it, besides the general infiltration of the cancellated portion of the bone.

This case is a good one, as it illustrates the chief points of interest in both the surgical and pathological bearings. I will now relate a case in which the result was recovery. I should apologize for again bringing this case before the Society; but as it best illustrates the points I wish to urge, I must ask your permission to do so.

Case 2.

A Mahomedan lad, aged 16, was admitted on the night of 10th April 1864, having received a severe injury to the right knee-joint by a kick from a horse; the joint was opened. Amputation at the lower third of the thigh was performed early on the morning of the 12th April.

On the 15*th* it is noted that the interior of the stump is exposed, the end of the bone denuded of periosteum, and the medulla discolored. Pulse 100. Feverish.

On the 19*th* a probe passed into the medulla; detected dead and putrid bone with pus. But no well marked constitutional symptoms, except pulse of 100. No diarrhœa. Appetite fair. Soft parts of stump quite healthy.

On the 21*st* mischief extending; long probe passes down to the head of the bone in the suppurating medulla. Pulse 104.

22*nd*.—Pulse 120. Fever in evening.

23*rd*.—Pulse 130; very excitable; quickens easily. Has diarrhœa.

24*th*.—Pulse 140. Feverish. Tongue moist, but smooth. Probe passes down to the head of the bone and causes pain there. Diarrhœa continues, peculiar muscular tremors, rāles in chest with cough. No hepatic tenderness.

Amputated at hip-joint by antero posterior flaps. Divided the bone just below the trochanter, but as pus oozed from the cancellæ, I at once removed it. His pulse, I should observe, was 150 when the operation commenced.

He remained in a very critical state for some days after the operation, but the pulse gradually came down. The temperature decreased; diarrhœa disappeared; tongue improved, and strength returned. On the 28th, for example, it is noted that the pulse is 140; temperature in axilla 102.

On the 3rd May the femoral ligature came away. Thermometer 98, pulse 128. Chest sounds are better; rāles less sonorous. Moist rāle in upper right chest less crepitant.

All this time he was well fed and supplied with port wine.

It is not necessary to trouble you with the daily details, sufficient that he made gradual progress towards recovery, and a sinus, which was the last indication of the wound, contracted and had perfectly closed by the 31st July. He was discharged cured on that day, and is now in robust health, employed as a tailor in the Hospital.

This case I regard as very interesting, the indications of blood contamination were so clear. The amputation at the hip-joint appears to have been only just in time to remove the source of blood poisoning; the youth of the patient enabled him to throw off the ill effects of the toxæmic condition to which he had been reduced. In all respects, therefore, this case is an interesting one, and, as I think, illustrates fairly the advantage of re-amputation, when the bone has become the seat of Osteo-Myelitis.

I have yet two other cases, which I would ask your attention to for a moment before concluding.

Case 3.

Patient's name Golam Alli; male; aged 20; Mussulman; syce; was admitted into the Medical College Hospital on the 2nd September 1863, 2 P. M., with a vertical wound about three inches long on the right shin. The right leg also was severely bruised. Two small bruises on the anterior aspect of each of his knees, and one on the external aspect of each of his ankles; no fracture of bones.

The bruised tissues began to slough, and on the 9th September the sloughing had increased, the tibia was exposed and denuded, but not dead.

From the evening of this day he had fever, without shivering, for three or four days. The fever left him, and on the 17th the ulcer looked healthy, there was no fever, and the denuded bone was covered with healthy granulations.

On the 19th he complained of some pain in the ulcer, but was otherwise the same; had an attack of fever on the 28th; on the 30th the ulcer was healthy; a scale of bone necrosed, but not yet exfoliated; the patient very much emaciated and countenance somewhat anxious; had another attack of fever on the evening of 30th; complained of pain in the chest.

On the morning of the 2nd October it was reported that he had fever last evening; pulse 130; increase of temperature in the right knee-joint; tongue moist, is slightly feverish; appetite poor; is thirsty.

The fever returned almost every day at evening, and on 5th October some abscesses were detected in the right leg, one on

the outer side of the knee-joint about the head of fibula, and another on the inner side of tibia, about two inches below the knee. The abscesses were opened.

6*th*.—The abscesses discharged freely, but he still complained of a good deal of pain in the knee-joint. Pulse quick, 140, tremor of hands.

He gradually became worse, and died on the 10th October 1863.

Post mortem, twelve hours after death.—Body very much emaciated. On opening the chest the lungs were found to be adherent to the parietes by some old adhesions, more so in the lower lobes of both lungs posteriorly patches of lobular inflammation were found scattered in both the lungs to a more or less degree: of these, some were in a consolidated state, with white patches, others far advanced in suppuration. The heart with its coverings appeared healthy.

On opening the abdomen the liver was found to be somewhat enlarged in size, but otherwise healthy. Kidneys and spleen normal.

On laying bare the right leg about the ulcer, it was found to be a mass of suppuration, which extended downwards and upward, in the latter situation burrowing into the cavity of the knee-joint. The medulla of the bone (tibia) was found to be infiltrated with pus. The lining membranes of the peroneal and posterior tibial veins were found to be covered with puriform fluid. On tracing the popliteal vein upwards, a coagulum was found blocking up the calibre of the vessel. This coagulum extending to about half of the external iliac, and at the position where the vein passes under Poupart's ligament to form the iliac, there was found a coagulum of blood with a cavity in the centre filled with puriform matter.

Case 4.

Patient's name Byconto; male; aged 25; Hindu; by occupation boatman; was admitted on the 14th February 1864 with gun-shot wounds in the right thigh with fracture of great trochanter. There were two wounds, one about the size of half a rupee, and the larger of the two was situated about the middle of his right thigh, a little to its outer side, and another about three inches above the trochanter of the same side, but in a line with it—in its passage the bullet had struck the trochanter major and fractured it.

The patient came in three days after the accident. He did well, for two or three days was without fever, the wounds discharging healthily; on the 19th he was slightly feverish; discharge from the wounds copious. Bowels rather loose; tongue furred, and pulse quick.

On the 20th and 21st he was much about the same.

On the 22nd, 23rd, and 24th there was no fever; the ulcers looked healthy, and the discharge was less.

On the 25th and 26th he was again feverish in the evening; discharge healthy but copious; wound flabby. Complained of loss of appetite.

On the 27th an incision was made upon the trochanter major and some bits of necrosed bone removed. On the evening of 27th he was again feverish and complained of much pain in the leg. He gradually got worse, his appetite failed; discharge became fœtid; tongue dry and furred; had fever every evening, and gradually sunk on the 6th March 1864.

Post mortem examination, 7th March.—Body much emaciated. There was lobular inflammation in both lungs, with Pyæmic patches. There were also several petechial spots. There was a patch of pleuritic inflammation on the lower and anterior portion of left lung. There was a large fibrinous clot in the right ventricle, extending into pulmonary vessels. Similar fibrinous clots also found in the left ventricle. Liver enlarged; slightly congested, but otherwise healthy looking. Kidneys healthy, Spleen enlarged and somewhat congested. Nothing abnormal in the iliac veins; the Trochanter major was splintered in two places, and the cancellated tissue infiltrated with pus.

I may not pursue this matter further, as I have already trespassed on your patience too long. If I have sufficiently illustrated my subject, I shall be satisfied, and trust that it will receive still further elaboration at the hands of some member of the Association.

Thanking you for the patience with which you have listened to me, I will no longer impose on your forbearance.

J. Lane Notter Esqre M.D.
with the Author's Kind regards and best wishes

LIGATURE OF THE LEFT COMMON ILIAC ARTERY,

BEING THE

SECOND OPERATION IN IRELAND,

AND THE

FIRST SUCCESSFUL CASE OF IT.

BY

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Condensed from Notes regularly and accurately taken by
WILLIAM WHEELER, Resident Pupil.

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LIGATURE OF THE LEFT COMMON ILIAC ARTERY,

BEING THE SECOND OPERATION IN IRELAND, AND THE FIRST SUCCESSFUL CASE OF IT.

Sergeant George K——, ætat. 43 years, was admitted into the City of Dublin Hospital on the 20th December, 1864. On examination, a large pulsating tumour was seen in the left iliac fossa immediately above Poupart's ligament, and dipping into the pelvic cavity, accompanied with the usual aneurismal bruit. It was of a triangular form, from four and a half to five inches wide in the transverse diameter, the base parallel to the ligament, its apex extending to the common iliac artery which appears to be dilated. The patient is of a robust frame, and never complained of any illness till the present time.

Previous History.—As he was walking about six months ago with a boot that did not fit him—*i.e.*, his left foot being slipshod, so that it threw the weight of his limb on the forepart of his foot, in the evening he felt a numbness in it. This continued with some intermissions, and in a few days he first perceived a swelling in his abdomen. Matters remained thus for five months, the numbness continuing, but the swelling increasing, at the end of this time he went to a fair, on his return home after a fatiguing day he perceived his leg swollen. Having shown it to his medical attendant he was recommended to go to the City of Dublin Hospital. He was given beef-tea for his dinner.

December 21st: ℞ Aquæ camp. ℥i.; troc digitalis, ♏x.; eth. chlorici, ♏vi. Ft. haustus. Cap. unus ter in die.

Observations and recapitulation of the treatment prior to having recourse to the operation.—The result of operations on this vessel have been so unfavourable, that in thirty-two cases recorded and tabulated by Dr. Smith, in the *American Journal of Medical Sciences*, vol. xl., N. S.,

1860, but six recovered. My case makes the number thirty-three, and adds one to that of the recoveries. These statistics induced me to have recourse to every variety of treatment by compression, if possible to avoid operating; also from considering the effect, proximate and remote, of suddenly and permanently arresting through the natural channels the direct supply of blood to one-half of the pelvis and the entire of the inferior extremity, so much so that the limb would, in all probability, perish before the feeble collateral circulation could be established to afford the requisite support. In addition to these impediments to success should be added the probability of consecutive congestions of the heart, the lungs, or of the brain, by the sudden and permanent arrest of the course of so large a quantity of blood. All these circumstances when fairly estimated increase the responsibility of the surgeon and the uncertainty of the operation. Compression was consequently carried out in the most sedulous and attentive manner; 1st, instrumental; 2nd, digital; 3rd, position by extreme flexion of the thigh in the hip-joint; 4th, compression on the distal side combined with that on the cardiac side of the tumour; 5th, by direct pressure on the aneurism by means of a seven-pound weight.

The treatment by compression was commenced on Monday, December 26, 1864, and was continued with much perseverance and regularity by Dr. Carte's compressor for six weeks, acting upon the primitive iliac, the course of which was easily and readily defined. When properly applied, it stopped the aneurismal pulsation completely, the tumour becoming flat and flaccid. Diet was regulated with every care and attention as follows, and at stated periods:—Breakfast—Bread, 2 oz.; butter, 2 oz.; tea, 2 fluid oz. Dinner—Broiled mutton, 3 oz.; bread, 3 oz; potatoes, 3 oz. Supper—Bread and butter, of each 2 oz.; weak tea, 2 oz. For the first three days of this treatment he took træ digitalis gut. decem ter in die, being ninety drops in three days; but it so weakened the heart's action that it was discontinued. Ordered wine one ounce and a half. For a time that this method was followed, the patient was placed under full doses of opium to narcotism; no benefit whatever was derived from it.

Chloroform was subsequently administered, for hours being fully under its influence, equally unprofitable in any way affecting the tumour.

Hydriodate of potash in five-grain doses ter in die was prescribed and taken for many days, in accordance with successful cases recorded by Bouillaud, with no benefit.

Acetate of lead and opium in three-grain doses three times daily; in forty-eight hours productive of Burton's characteristic blue line on the gums, which was well marked. It was discontinued owing to the colic caused by it. After a time it was again ordered, and again abandoned from colic. Of all the treatment medically adopted the lead was the only agent that appeared to produce any effect on the aneurism, giving some feeble evidence of a partial circumferential coagulum being deposited at its external and superior boundary. He had administered the træ ferri muriat. in ten drops three times a day for many days; no benefit whatever from it.

Carte's compressor having failed, as already indicated, I availed myself of Mr. L'Estrange's for compressing the abdominal aorta above its division into the primitive iliac and azygos sacral arteries for nearly a fortnight; though acting well, no utility whatever from it. Digital pressure was next had recourse to, and for fifty continuous hours I would affirm that no blood flowed into the aneurism. This pressure was maintained in the most sedulous manner by the educated, well-trained, and untiring care of the pupils of the hospital, whose zeal, activity, good feeling, and kindness in supporting my efforts to benefit this patient is beyond my praise; no advantage from it, still it was persevered in for five continuous days without any satisfactory result.

The double combined compression—that on the cardiac side of the tumour and on the distal side of it on the femoral artery—was of no benefit to the aneurism, but in my judgment was injurious to the patient, as it increased the œdema of the inferior extremity. The direct pressure on the aneurism by means of a seven-pound weight was of no advantage whatever. During the entire of the treatment by compression the continued and sedulous application of ice to the tumour was of no avail. Nothing now remained but the operation.

The following table expresses very accurately the times and manner of compression up to a short time prior to the operation:—Dr. Carte's apparatus from December 26th to January 9, 1865. Conical leaden seven-pound weight from January 10th to February 11th. Carte's

apparatus reapplied for twenty-four hours and forty minutes without intermission, February 13th. This apparatus with the leaden seven pound weight to February 26th. From this period instrumental and digital pressure to March 10th. From this date L'Estrange's clamp applied, combined with digital compression, to the 18th of April.

The medical treatment comprises the liquor pernit. ferri, substituted for the sol. ferri perchloridi, it changed for hydriod. of potash, which was discontinued, and the acet. plumbi with opium ordered. The limited diet prescribed on his admission was augmented considerably one month after it, and continued so up to the operation; in fact, full diet, alternating with wine and porter, according to circumstances.

The operation was performed on Saturday, April 29, 1865, in the presence of many of the surgeons of the city, also of Drs. Hadaway and O'Flaherty, Inspector-General and Deputy Inspector-General of Military Hospitals in Ireland.

Operation ten a.m.—The patient was well under the influence of chloroform before and during the operation. An incision was made from the point of the last rib, slightly curving downwards to Poupart's ligament, mid-distance between the anterior superior spine of the ilium and symphysis pubis about eight inches long, the superficial fascia and the three broad muscles were next carefully divided from below upwards and from angle to angle of the incision. Any hæmorrhage was venous, with the exception of the internal branch of the circumflex ilei vessel, which *was sliced*, a ligature was tied on each side of the opening, and the vessel divided between them. The transversalis fascia was perfectly *cleansed* and *free from any blood*; it was very strong, the smallest possible portion of it was pinched up in the forceps, and found by its transparency to be free of the peritoneum, the fascia was divided on the director for the entire extent of the wound, the peritoneum was freely exposed, and the colon seen beneath it. There was much less bulging of the viscera through the wound than I expected. The peritoneum was removed from the iliac fossa to the mesial line of the body with the greatest facility, I would say with more ease than in the dead subject; it carried with it firmly adherent the ureter. The aneurismal sac occupying the external iliac artery remained almost

in a state of repose—*i.e.*, did not project into the wound, as has occurred in similar operations, it was well defined at the cardiac or proximal end, and corroborated what was ascertained before the operation of dipping deep into the pelvic cavity, perhaps compressing the external iliac vein, so accounting for the great œdema of the entire of the left limb. The common iliac artery was now exposed and visible to the naked eye, the vein was not equally apparent. The separation between these vessels was easily effected by slight scratches with my finger-nail, which I had previously sharpened by filing the inner edge, serving by so doing as a blunt knife, and could scarcely commit any mischief, a hempen ligature was then passed under the artery from within outwards, on compressing it on the aneurismal needle all pulsation in the aneurism completely ceased, *it becoming so flat as to have disappeared*. The genito-crural nerve was embraced by the ligature in the first instance, from *which it was excluded*. The extreme sensitiveness of this nerve astonished me. It was twice very gently touched to free it from the ligature, on each occasion it roused him to perfect consciousness from a deep anæsthetic sleep, and the artery tied about half or three-quarters of an inch above its division into the external and internal iliacs.

Prior to the operation a doubt passed through my mind as to the effects of the instrumental and digital pressure upon the peritoneum, rendering it more or less adherent to the iliac artery and vein, also as to the more or less intimate adhesion of these vessels to each other. This doubt was completely set at rest by the great facility with which the peritoneum was removed, both from the iliac fossa and the vessels, also from the little impediment I experienced in separating them from each other so as to permit the needle and ligature to pass between them. It may be instructive to remark on this step of the operation a few days before it I operated upon a thin adult female; the artery and vein were intimately adherent, in passing the needle between these vessels I wounded, as I thought, the common iliac vein, as blood flowed; on the instant, it was withdrawn and a fresh place selected, which allowed the needle to be passed without any injury, the ligature was tied, the artery and vein were subsequently removed to examine what injury was inflicted on the vein, it was laid open and was found to be uninjured. The vein which had been wounded was a vas aberrans, in close contact

with the common iliac one. In contrasting this operation with that on the dead body, which I have performed some forty or fifty times during my professional opportunities, what struck me as so remarkable and exceptional was the great facility I experienced in removing the peritoneum from the iliac fossa to uncover the artery and vein, also from the extreme case in passing the needle between them. Though furnished with a numerous variety of aneurismal needles to surmount this anticipated difficulty, the ordinary one, with the handle a little longer than usual and the eye circular, as near to the point consistent with strength, rounded well off in the smoothest manner, afforded every facility for passing the ligature under the artery. It was made for me by O'Neill of Henry-street, a surgical cutler who is *au courant* with all the surgical improvements of the day.

The wound was then dressed with metallic sutures, strips of adhesive plaster, the limb carefully enveloped in cotton wadding and flannel, and the man placed in bed.

Before the operation the pulse was firm, full, and 80 in the minute.

Observations on the operation.—The incision selected afforded the greatest facility in bringing the vessel into full view, it also showed the ureter attached firmly to the external surface of the peritoneum, altogether free of the artery. I experienced very little or any inconvenience from the protrusion of the intestines into the wound, though prepared with retractors of various sizes and kinds. The best were the hands of my assistants, completely superseding all the others, from what I experienced in this operation as to retraction and maintaining the peritoneum and contained intestines away, and kindly protected from injury of any kind. I would say no retractors were equal to the hands of intelligent and trusty assistants.

As already mentioned, the aneurismal sac did not project into the wound, nor in any way add to the depth of it. The iliacus internus and psoas magnus muscles were also well brought into view. The little inconvenience experienced by the intestines but slightly projecting into the wound, I attribute to two causes: 1st, the Thursday previous to the operation the bowels were freely opened by pil. rhei co. gr. x., followed in some hours by a Seidlitz powder, and three hours before the

operation an enema of full quantity with some oil was administered by the long tube, which completely emptied the rectum and sigmoid flexure of the colon. 2nd. To the advantage of the administration of chloroform, so judiciously given by my young friend Mr. Hewitt, and so carefully and continuously maintained by him during the operation, which placed the system in absolute repose, rest, and quietude, *with complete relaxation of all the abdominal muscles*, even the diaphragm—an incalculable benefit.

The comparative indistinctness of the iliac vein I attribute to it being compressed by the aneurismal tumour, which passed over it into the pelvic cavity and prevented it being in any way distended by the returning blood to the heart. This compression of the vein also explains very satisfactorily the œdema of the entire of the left inferior extremity, which was two inches greater in circumference than the right one on Thursday, or forty-eight hours before the operation. Until the operation was being performed, I attributed the œdema in part to the distal pressure upon the femoral artery as it emerged from the aneurism which had been applied for many days before the operation.

In performing this operation all the steps were taken in reference to securing the common iliac artery, and in place of seeking for it from the guidance of the external iliac, I sought it directly from its own anatomical relations. By a very simple proceeding the projection of the viscera into the wound was prevented by gently turning the patient slightly on his right side, when they glided and rolled over into the right iliac fossa, and caused no embarrassment whatever in the subsequent steps of the operation.

On applying my finger upon the artery before tying it, the rapidity of the course of the blood through it was most remarkable, accompanied by a constant whiz, whiz, whiz, the sensation of friction was also most remarkable, as if caused by very minute grains of very hard sand. If the friction which I felt under very moderate pressure is the normal condition in the arteries during the circulating torrent, the value of the lining coat in preserving them uninjured against friction is not generally appreciated or known.

In place of giving the daily reports as noted in this case, it will be equally interesting to record the principal symptoms as the *résumé* of what

was observed. Three hours after the operation the pulse rose to 88 full, from being 80 before it was performed; no pain in the limb, but slight numbness referrible to the great toe; some arrow-root was given to him at six p.m. Complained of great aching and burning pain around the ankle-joint, particularly at the external malleolus; feels the limb very warm and very heavy. ℞ Liq. opii sed. Bat. gut. xx., sp. am. arom. gut. x., ether. chlorici gut. x., aq. distil. ℥i. ft. haustus statim sum.; to have ice and whey. Eleven p.m.: Much relieved; had some sleep; pulse 100, not as full as at two p.m. Rept. haustus anod. April 30, second day, eleven a.m.: Very tranquil night, scarcely any pain about the ankle; feels weight of limb less than yesterday; little thirst, had a severe fit of sneezing, and was alarmed by a show of blood from the wound, but no evidence of hæmorrhage. Countenance less haggard than yesterday; pulse 120, not full; passed water frequently during the night. To have beef-tea, rice.

Five and ten p.m.: A most favourable day; no pain or uneasiness; weight of limb less; pulse 120 full; micturated freely; inclined to sleep. Haust. anod. si opus sit.

May 1st: Very quiet night; slept well on the draught; pulse 116, full; wound dressed, with a *free discharge* of sanguineous serum, and traces of pus in it. To have chicken broth and oranges.

May 2nd: A good night; pulse 120; copious discharge of puriform fluid from the wound, the result of Cellulitis, with a strong feculent odour from the superior part of it, and agglutination at the inferior angle of it. The tumour smaller but very soft; a blue vein appearing in the mesial line of the abdomen, extending from the xiphoid cartilage of the sternum to the pubis. Diet as yesterday, to have a cathartic enema, P. B. vespere.

Ten p.m.: Enema acted well, bringing away much flatus; the pain has returned in the ankle, of the same character, but not so severe; pulse 120; the anodyne increased by five drops; œdema of the thigh diminishing.

3rd May, fourth day: A tranquil night; some pain still about the ankle, describing accurately the course of the filaments of the external saphenic nerve; pulse 120, soft; wound dressed, the edges in close apposition, a large quantity of brownish coloured serum easily pressed from

the inferior angle of it, and free from feculent fœtor. Had an anodyne draught at four a.m. To have chicken broth, beef-tea and rice; perspiring. Ten p.m.: Pain in the ankle continues, numbness and sensation of weight of limb less; some pain from lying on the right trochanter; relieved by a water-cushion. Repeat the anodyne.

4th May, fifth day: Easy night; pulse 112; no pain of limb; œdema rapidly subsiding; full discharge of dark coloured serum from the wound; incision diminishing in length; tumour less prominent, contents more firm; no pulsation; still of the same dimensions; abdominal veins more evident; perspiration less than yesterday; countenance assuming a haggard appearance; four ounces of sound claret added to his diet.

Ten p.m.: A dark, large solid alvine evacuation, with much pain, but great relief following it; abdomen slightly tympanitic.

From this date till the 8th of May, and the *ninth day* from the operation, the brown-coloured serum was succeeded by *large quantities of laudable pus* from the wound, which was daily dressed; the diet and claret wine continued; the anodyne of Battley's sed. liquor. sometimes twice in the night. To relieve the perspiration, the syrup of cinchona (Donovan) in half-drachm doses in cinnamon water was ordered; he suffered occasionally from an over-distended bladder, requiring the catheter No. 9; the urethra perfectly free; tumour diminishing in size. This day *pulsation was detected in the aneurism*, feeble but quite evident, more so *immediately above Poupart's ligament, some indication of an artery pulsating in this locality*; the pulsation was unaccompanied by any bruit or vibratory thrill. Pergat in omnia medicamenta.

From this period, the 8th, the daily reports can be condensed into the following: commencing sensation in the foot; can move it and is inclined to move it; free purulent discharge from the wound; the upper half uniting and united permanently; complains of burning pains at the upper and external part of the patella; return of pain in the ankle; this patellar pain was very distressing to him; bowels moved by cathartic enema with sp. terbinthinæ. The pulsation in the aneurism ceased on the thirteenth day after the operation, being present from the ninth to this date. Scarcely any discharge from the wound; bladder occasionally requiring to be relieved by No. 9 catheter; getting more power over

the limb; œdema lessening; the extensor tendons on the dorsum of the foot well defined; nocturnal rest good, but assisted by the anodyne.

20th May, twenty-first day from the operation: Ligature firm and fixed upon the artery; countenance cheerful; pulse 88, full, round, and bounding.

21st May, twenty-second day after the operation: Ligature apparently protruding from the wound; at ten p.m., the pulsation returned more evident than at any time since the ninth day after the operation; still neither bruit nor vibratory thrill in it. From this date nothing much worthy of note was observed, except the intermission in the pulsation, almost always best marked in the vicinity to Poupart's ligament; co. pil. rhei occasionally required to regulate the bowels.

28th May, twenty-ninth day after the operation: I was much gratified by being able to bring away the ligature; not a drop of blood appeared; it was as strong and sound as the day it was applied; the arterial loop would admit but an ordinary small sized probe. This fact proved the success of the operation on the artery.

From this period all apprehension as to secondary hæmorrhage was removed, and the report on the thirty-first day after the operation states, scarcely any discharge from the wound, which gapes much at the inferior part of it, owing to the action of the abdominal muscles drawing the internal edge to the mesial line, which was in part prevented by appropriate dressing. On readjusting the flannel roller and cotton wadding on the limb, the external edge of the foot, and the integuments in relation to the little toe and corresponding half of the metatarsal bone presented a deep ecchymosed appearance, and was perfectly cold, which he did not perceive; the œdema gone except a little puffiness about the external ankle, and the limb much atrophied.

This appearance too plainly announced that the powers of the circulation were unable to maintain the vitality of these parts; he was ordered bark and ammonia, phosphate of iron in pill, and port wine substituted for the claret to meet his desire. From June 3rd to the 9th, forty-first day, he was gaining power over the entire of the extremity, feeling it as strong as he ever did; but anomalous symptoms occasionally were present, as neuralgia of the rectum, allayed by opiate suppositories, occa-

sional retention of urine, some vomiting, relieved by hydrocyanic acid in effervescence, and the gangrene attacking the great toe; while the aneurism was evidently smaller, still occasionally exhibiting pulsation, but no bruit or thrill. Up to June 13th, forty-fifth day from the operation, though expressing himself "as being quite strong and fit for walking," with full power over the toes, the foot had never recovered sensation from the time of the operation, and the gangrene was extending to the other toes, perfectly dry, in fact mummifying them, and strictly limited to the phalanges, the aneurism slowly diminishing under well-regulated compresses, but at irregular intervals pulsating in silence. He was attacked with purging and occasional involuntary discharges from the rectum, but in small quantities, checked by starch enema and tinct opium. His spirits good and sanguine as to restoration to health. Report states in June 15th, complains of much uneasiness about the anus, very painful when he sits up; a small superficial fissure was detected, one on the anterior and one on the opposite side of it, both touched with the solid nitrate of silver.

On this day he was taken to very comfortable lodgings in Sandymount, without any distress, expressing great delight at the change of air and scene. For the first eight or ten days every thing promised well for recovery, spirits good, strength returning, walking about his bedroom with the assistance of crutches, fissures of the anus healed, retained power over all his toes, but the dry gangrene indelibly marked, and no fœtor, a line of demarcation appearing accurately parallel to the metatarso-phalangeal articulations. Has had some diarrhœa, with involuntary alvine discharges, controlled by chalk mixture, kino, tinct opium. and starch opiate enemata. 28th June, sixtieth day from the operation: Improving in strength; moving well about on crutches; wound filling up; diarrhœa less, but a lurid, dark-red blush appearing on the dorsum of the foot. From this date the gangrene extended on the foot, both on the dorsal and plantar surface, of the moist character, with some fœtor, which was entirely checked by dressing with powdered charcoal. He was given bark, ammonia, opium, capsicum, and camphor; œdema of the leg extending up to the hip-joint.

July 3rd, sixty-fifth day from the operation: It was noted, I have been much disappointed by the symptoms presented by this patient since

his removal to the country, now nineteen days; no permanent improvement from change of air, and the weather magnificently fine; tumour slowly diminishing, but the contents still fluid near Poupart's ligament.

July 5th: Brought to the hospital; virtually no permanent improvement, while a large pelvic abscess presenting in each nates, freely communicating from side to side between the rectum anteriorly, and the sacrum and coccygeal bones posteriorly, from which, by puncture, twelve to fourteen ounces of thin, fœtid pus of a feculent odour flowed, mixed with gases; the abscess was opened in each nates. ℞ Decoct. cinch. ℥v., trœ cinch. co. ℥i., chlor. pot. ℥i., acid. mur. dil. ℥i., syrup. cort. aurant. ℥iv., trœ opii ℥i., ter, horis. ℞ Sulp. quinæ, gr. xxx., camp. gr. xviii., pil xii. cap. ii., unam sing., dose decoct. cinch.

7th, sixty-ninth day: Quiet night; abscess discharging; freely injected or washed out with a solution of permanganate of potash; pulse fuller, but he is much prostrated.

8th, seventieth day: Restless night; continued drain from the abscess—very fœtid; gangrene not extending; aneurism diminished in size and getting hard. When the abscess was injected with the solution of permanganate of potash, he suffered more pain than yesterday. Ten p.m.: Ordered mur. morph. gr½, to be repeated.

9th, seventy-first day: Arterial hæmorrhage at seven a.m., from the abscess in the right pelvis, arrested by liq. fer. perchlor. Found him very weak and chilled; wine and stimulants rallied him.

10th, seventy-second day: Passed an uneasy night; no hæmorrhage: took forty-eight ounces of wine yesterday. Tumour reduced to a very small size; the wound very flabby, and not inclined to heal; line of demarcation on the whole circumference of the tarsus well marked, exposing the extensor tendons and plantar fascia. Ten p.m.: Rambling; pulse frequent and small; great discharge from right nates, of a rusty colour, not very fœtid. ℞ Sp. am. arom. liq. Hoffman anod., sp. lavand co., sp. chloroform and camp. julap.

11th, seventy-third day: Smart arterial hæmorrhage at ten a.m. from the right nates, but little blood lost; arrested by compress and liq. ferri perchloride. Gradually sinking, and expired about nine p.m.

Post-mortem examination by Mr. Thfoell and Mr. Croly.—An incision was

made through the integuments from above the umbilicus to the symphysis pubis, and a second incision from the same point to the anterior superior spinous process of the ilium. The muscles and fascia transversalis were next divided; the intestines were adherent in the left iliac fossa, bound down by firm bands of lymph, evidently the result of inflammation. The intestines being drawn up the fascia iliaca was exposed, covering the iliacus internus muscle; the ureter was observed crossing the anterior surface of the common iliac artery, just at its bifurcation. The aneurismal tumour, which was soft and fluctuating to the touch, measured five inches by two and a-half, behind and to its outer side, lay the anterior crural nerve flattened and expanded. The abdominal aorta was exposed as high as the origin of the inferior mesenteric branch; it presented a normal appearance as regards size; an inch above its bifurcation into the common iliacs a calcareous deposit, about the size of a four-penny piece, was seen protruding through the coats of the artery, it occupied the right side of the vessel. The left common iliac artery (that on which the ligature was applied) was much smaller than the corresponding artery of the other side; there was a fibrinous clot in it, just below its origin from the aorta—the vessel was severed by the ligature half an inch above the bifurcation into the internal and external iliacs. On passing a probe through the internal iliac into the common iliac, it was stopped by the adhesion of the vessel at the distal side of the ligature, the same occurred on passing a probe through the aorta into the common iliac. The common iliac vein was closely adherent to its artery, and the external vein was pressed upon by its artery. Femoral artery and vein healthy and of natural size. Iliac fascia unusually dense, and closely bound to the vessels; a large oval lymphatic gland occupied the left side of the common iliac artery, which was seen during the operation of a bluish colour. The pelvic cavity was filled with unhealthy pus, the pelvic bones sound, and not indented by the tumour. Internal epigastric artery slightly enlarged. A probe passed through it into the aneurismal sac touched a soft fibrinous clot. Walls of sac thin.

The aneurism was egg-shaped, the larger end downwards and a little inwards, measuring five inches in length, three and three-quarters in depth, and extended from about one inch from the origin of the external iliac artery, *which was enlarged* to within one and a-half inches of the

profunda covering the external iliac vein for about two inches of its course externally and posteriorly. The tumour, on being laid open for the entire of its extent, contained at its two superior thirds, a very soft, greyish fibrinous clot, but not distending it, in the inferior third was a soft, black blood deposit, scarcely to be considered a coagulum, being so friable. The aneurism communicated with the external iliac vein by a well-defined oval opening of about one quarter of an inch in diameter, situated a little below the middle of the tumour on its internal and posterior aspect. The epigastric, slightly enlarged, could be traced backward to the same opening the arterio-venous on the internal and posterior part of the aneurism, *and seemed to form, prior to its communication with the aneurism, a small cavity capable of containing a bean, which was filled with fluid blood.* By this examination the disease I had to contend with was not true aneurism, but that of aneurismal varix (or arterio-venous aneurism), in this case being a spontaneous formation (in contradistinction to the traumatic variety), which has been recorded by Bransby Cooper, Perry, and my late colleague Professor Porter, affecting the femoral vessels, being a primitive disease, the result of thinning of their coats. This rare variety was surmised early in February, for, combined with a well-marked bruit de soufflet, there was also a most remarkable vibratory thrill which was occasionally so loud and strong as to mask the proper aneurismal bruit; although from the phenomena indicated by the stethoscope no doubt remained on my mind, which was often expressed to the class, that there was more in this affection than a simple aneurism; the surmise being completely cleared up by the post-mortem examination presenting a well-marked complication of the direct communication between the vein and artery, and still more complicated by the direct entrance of the epigastric artery into the inferior part of the aneurism. The specimen is in the Pathological Museum of the Royal College of Surgeons, so well described and displayed by our curator, Dr. John Barker.

Observations.—After reading the disclosure made by the post-mortem examination, so accurately noted by my colleagues, the result of the operation was most satisfactory, the ligature having acted in the most efficient manner, when the aneurism was laid open and its true pathological character seen, revealing as it did the disease of aneurismal varix, which frequently presents so much difficulty in the successful treatment, in this complicated example affording difficulties insurmountable to effect a cure by operative surgery. Would any surgeon be justified, even after having ascertained the true character of the disease; first, to secure the common iliac, then to tie the external where it emerged from the aneurism, which would have failed unless the epigastric was also secured by ligature which carried the blood direct into the sac, as established by the post-mortem examination, and was the principal vessel for carrying on the collateral circulation to the inferior extremity, causing the feeble and silent pulsation so often observed in the aneurism after the operation; or, would he more heroically extirpate the entire of the disease with the vein and tie the ends of it and of the artery, if it could be performed, what would have been the condition of the circulation in the inferior extremity after such a proceeding? The manner in which the epigastric artery communicated with the aneurism showed the stream of blood divided between it and the limb—the extraordinary fact elicited by this was the length of time intervening between the operation and the incipient mortification being thirty-one days, when the supply of blood was in such small quantity to nourish the limb for this comparatively lengthened period. This case must be considered a most exceptional one in relation not alone to the pathology, but also to the difficulties which the surgeon would have to encounter and to surmount for successful treatment; it will also serve as a beacon to those who follow the high mission of conservative surgery to consider and carry out what may be the successful practice, which will afford me the greatest gratification and pleasure. In this case the disease was not stationary, the tumour gradually increasing under every kind of compression; the enlargement of it was in no way checked till the artery was tied, which completely and permanently arrested its further increase, establishing, in certain cases, the superiority of the ligature over compression; it is well for surgery that we have the ligature always in reserve, from the time of its application feeble efforts were made to form a fibrinous deposit at the superior part of the tumour, while the slightly enlarged epigastric by the collateral circulation fed the inferior part of the aneurism with blood, which, twenty hours after death, presented an unadhesive clot

and some in a fluid state. Still, from the appearances presented in the aneurism, though gangrene had attacked the foot as high as the tarsus, which was being arrested by a well-defined line of separation, I am strongly inclined to the opinion this patient would have permanently recovered with the partial loss of his foot but for the formation of the very large pelvic abscess, which was formed in a few days, announced by no constitutional premonitory symptoms, none but some trifling pain referred to the nates, three or four days before his death. It may be asked, what caused this abscess to form so silently, I might say secretly, and to be of such magnitude in so short a time? The only solution presented to me for explaining this occurrence is, that the blood in a healthy estimation was below par, consequently more liable to be affected by debilitating causes, such as gangrenous purulent absorption, and thus giving rise to the extensive pyæmia and gangrenous abscess which caused his death—in fact, a blood disease. It may be objected to the treatment of this case, that the compression was too long continued before proceeding to operation; but be it remembered, that the success of treatment by compression varies considerably; in twenty successful cases the time varied from sixty hours to eight months, the average being nineteen days.*

From the experience gained in this case, in any other in which it would be prudent to have the ligature applied to the common iliac artery, after having given both instrumental and digital compression one month's trial, in case of failure, I would then proceed to the operation, which was delayed so long for two reasons—one was to give the fullest trial to compression, the other was that the collateral circulation would have been better developed, no such result followed, except a small increase in the diameter of the epigastric artery. The practice of surgery appears to be experiencing a remarkable change in the controlling of arterial hæmorrhage by other means than by the ligature. From the position which I have the honour to hold in the School of the Royal College of Surgeons, I cannot, without much more experience than we at present possess, supersede this valuable and well-tested means of commanding hæmorrhage, in favour of acupressure, the catgut, lead, metallic, silk, and

* System of Surgery, by Holmes, vol. iii., p. 418.

others; we have now the *hemp ligature*, which will supersede all others, for the firm way in which it remains on the artery, the complete absence of irritation, and no alteration in its strength or soundness.

In conclusion, I may record that the subject of this most rare and important case is of historic interest, having served in the 22nd Regiment of Infantry, in the conquest of Scinde, under Sir C. Napier; he was one of the chosen few who accompanied their chief to take the celebrated fortress of Imaur Ghur, held by the Ameers situated in the desert, eight days march from the head-quarters of the army; during the march it is stated that some of the men slaked their thirst by drinking their urine, their supply of water having been exhausted before coming to the citadel. This feat of endurance, privation, valour, and conquest has but one feeble parallel in military warfare, which occurred in Africa during the Roman Republic, when Marius entered the Libyan desert to take Capsa, the march to it was neither so long nor the heat so great as in Scinde.*

References to the woodcut explanatory of the condition of the parts as exhibited by the post-mortem examination: *a.* Clean and defined section of the artery by the ligature; *b.* fibrinous clot in the left common iliac artery, immediately below its origin from the aorta, obliterating the canal; *c.* ureter thrown down to show the site of the ligature; *d.* vena cava; *e.* right common iliac artery; *f.* calcareous deposits protruding the coats of the aorta to the right side, the size of a four-penny bit; *g.* abdominal aorta; *h.* anterior crural nerve, enlarged and flattened; *k.* external iliac artery enlarged, terminating in and forming the aneurism. The shading of the tumour indicates very accurately by colour the portion of the aneurism which contained the fibrinous clot, and the clot formed solely by the blood, carried directly by the epigastric artery into the aneurism; * the asterisk indicates the place of the communication between the artery and vein constituting the aneurismal varix; *l.* internal

* Napier's History of the Conquest of Scinde: Sallust in the Jugurthine war.

iliac artery; *m.* crural nerve emerging from beneath the aneurism; *n.* femoral artery; *o.* femoral vein; *p.* profunda artery and vein; *r.* epigastric artery enlarged, entering into the inferior part of the aneurism.

The woodcut, by Mr. Oldham, graphically displays the pathological specimen.

APPENDICE

DE LA NOTICE SUR LE

PERFECTIONNEMENT

DU

MATÉRIEL DES AMBULANCES VOLANTES [1]

PAR

HENRI ARRAULT

Secrétaire de la Commission d'hygiène publique et de salubrité

(18e Arrondissement)

Auteur de la Médecine domestique des pays chauds, des Tableaux synoptiques d'Hygiène, Médecine, Pharmacie et Toxicologie à l'usage des capitaines au long cours, du Cultivateur vétérinaire, du Guide médical et de l'Abrégé de Médecine vétérinaire à l'usage du chasseur.

FOURNISSEUR DES AMBULANCES VÉTÉRINAIRES DE L'ARMÉE FRANÇAISE

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[1] CHEZ L'AUTEUR, 11, RUE DE L'EMPEREUR

Près l'ancienne barrière Blanche

PARIS-MONTMARTRE

ET CHEZ VICTOR ROSIER, RUE CHILDEBERT, 11

A LA LIBRAIRIE MILITAIRE

1862

Se trouve aussi la Notice sur le perfectionnement des ambulances volantes

APPENDICE

DE LA NOTICE SUR LE

PERFECTIONNEMENT DU MATÉRIEL

DES AMBULANCES VOLANTES

Depuis l'impression de notre notice sur le perfectionnement du matériel des ambulances volantes [1], nous avons ajouté à ce matériel décrit dans cette notice, les nouveaux appareils suivants :

1° Un Brancard pour relever les blessés, et pouvant au besoin servir *de table à opérations*.

2° Un Fourgon à 2 roues pour le transport des ambulances volantes.

3° Un Fourgon à 4 roues pour le transport des blessés.

4° Un Fauteuil-Cacolet.

5° Un Lit d'Hôpital.

[1] Chez l'Auteur, rue de l'Empereur, 11, près la rue Blanche, et chez Victor Rosier, libraire, rue Childebert, 11.

BRANCARD. — Ce brancard destiné à transporter les blessés du champ de bataille à l'ambulance, peut, au moyen d'une forte tension opérée sur la toile par un moyen simple et facile, être immédiatement transformé en une table à opérations très-douce au blessé.

Ce brancard n'existe pas dans le matériel des ambulances de l'armée : en le créant, nous croyons avoir mis entre les mains des chirurgiens militaires, un instrument précieux.

Ce brancard ne pèse que 13 kilogrammes et peut supporter un poids de 150 kilogrammes.

Replié, il se trouve réduit à un petit volume, ce qui en rend le transport facile.

FOURGON A DEUX ROUES POUR LE TRANSPORT DES AMBULANCES VOLANTES. — Ce fourgon n'est autre que ce léger et solide fourgon Larrey, dont l'illustre chirurgien nous a laissé le dessin dans ses mémoires, et qu'on a eu la malheureuse idée de supprimer pour le remplacer par ce lourd et informe fourgon à quatre roues, dont le plus léger accident de terrain arrête la marche, et qui ne peut suivre une armée pour peu que la marche de celle-ci soit rapide, *comme cela est arrivé à Solferino* [1].

Mais quoique léger, il peut cependant arriver que

[1] Voir pages 14 et suivantes de la notice citée.

ce fourgon soit lui-même arrêté par des obstacles infranchissables : en prévision de ces accidents, on a placé dans ce fourgon, des ambulances volantes, tels que *sacs, saccoches, cantines*, renfermant toutes les ressources des pansements, *non éparpillées* comme elles le sont dans les fourgons régimentaires, *mais réunies ensemble* : de cette manière et dans le cas dont nous parlons, un sac, une saccoche, une paire de cantines, peuvent être facilement et en quelques minutes retirés du fourgon, puis rapidement portés là où le besoin s'en fait sentir ; le chirurgien n'a plus alors à craindre ces déceptions, sur lesquelles il a eu plus d'une fois à gémir, car il peut avoir ainsi à sa disposition et promptement tout ce dont il peut avoir besoin.

Ce fourgon contient :

10 paires de cantines ; chaque cantine renfermant des ressources pour 400 pansements : soit pour 4,000 pansements,

ou bien :

144 sacs d'ambulances : chaque sac renfermant des ressources pour 30 pansements : soit pour 4,300,

ou bien :

120 paires de saccoches : chaque paire de saccoches renfermant des ressources pour 30 pansements : soit pour 3,600.

Ce fourgon est surmonté d'une hampe, disposée pour recevoir alternativement, le jour, *un drapeau*

noir, et la nuit, un *Phare* pour indiquer le lieu où il se trouve.

FOURGON A QUATRE ROUES POUR TRANSPORTER LES BLESSÉS, DE L'AMBULANCE DU CHAMP DE BATAILLE, AUX HOPITAUX DES VILLES. — Dans ce fourgon, on peut mettre 8 soldats blessés aux membres supérieurs, ou bien 4 soldats blessés aux membres inférieurs.

Les blessés y sont placés dans *des fauteuils suspendus !...* Précaution prise dans le but de rendre moins douloureuses les secousses produites par les cahots.

FAUTEUIL-CACOLET. — Ce fauteuil destiné au fourgon des blessés, peut, en renversant son dossier d'avant en arrière, prendre la forme d'un cacolet très-commode et très-doux : en le repliant sur lui même, il n'a plus qu'un volume comparativement très-restreint, et on peut en mettre un assez grand nombre dans un fourgon.

LIT PLIANT POUR HOPITAL. — Ce lit est d'un facile transport : quoique léger, il est très-solide : il peut être utilement employé dans les hôpitaux.

Les cinq appareils dont nous venons de donner la description sommaire, étant réunis à nos sacs de l'infirmier et du bataillon, à nos saccoches et à nos cantines chirurgicales, forment un matériel d'ambulance complet.

Donner aux fourgons d'ambulances une forme solide et légère, qui permette de leur faire suivre tous les mouvements d'une armée, malgré la précipitation des marches ou des accidents de terrain.

Mettre dans ces fourgons des ambulances portatives, où se trouvent réunies toutes les ressources des pansements, au lieu de tenir ces ressources divisées comme elles le sont dans les fourgons régimentaires !

Disposer les ambulances volantes de telle sorte qu'elles puissent être en tous lieux facilement transportables : les agencer de façon que le chirurgien puisse voir et prendre sans perdre une seconde, le linge, le médicament, l'instrument dont il peut avoir besoin.

Créer pour les blessés un mode de transport qui puisse diminuer leurs souffrances et prévenir les nécessités de certaines opérations !

Améliorer, en un mot, ce qui existe et mettre entre les mains du corps de santé militaire, des instruments de salut meilleurs que ceux qu'il possède !... Telle est la pensée qui nous a été inspirée par la lecture des œuvres de Percy et de Larrey, ces deux providences de l'ancienne armée ! Cette pensée, nous avons cherché

à la réaliser, en créant notre matériel d'ambulances. Si nous n'avons pas complètement atteint le but que nous nous sommes proposé, nous dirons, sans immodestie, que nos ambulances peuvent rendre des services que nous n'hésitons pas à déclarer impossibles avec les ambulances régimentaires.

Nous livrons sans crainte cette opinion personnelle, au contrôle éclairé de ceux de messieurs les chirurgiens militaires qui nous feront l'honneur de venir voir nos ambulances. Elles seront mises à leur disposition tous les jours de 2 à 6 heures, les dimanches et fêtes exceptés.

HENRI ARRAULT.

14,341 — Abbeville, imp. R. Housse.

NOTICE

sur le

PERFECTIONNEMENT DU MATÉRIEL

DES AMBULANCES VOLANTES

10,055 — ABBEVILLE, IMP. R. HOUSSE

NOTICE

SUR LE

PERFECTIONNEMENT

DU

MATÉRIEL DES AMBULANCES VOLANTES

PAR

HENRI ARRAULT

Secrétaire de la commission d'hygiène publique et de salubrité

(18e Arrondissement)

Auteur de la Médecine domestique des pays chauds, des Tableaux synoptiques d'Hygiène, Médecine, Pharmacie et Toxicologie à l'usage des capitaines au long cours, du Cultivateur vétérinaire, du Guide médical et de l'Abrégé de Médecine vétérinaire à l'usage du chasseur.

FOURNISSEUR DE L'ARMÉE FRANÇAISE

SE TROUVE

CHEZ L'AUTEUR, 11, RUE DE L'EMPEREUR

Près l'ancienne barrière Blanche.

PARIS-MONTMARTRE

ET CHEZ VICTOR ROSIER, RUE CHILDEBERT, 11

1861

Paris, le 10 Juin 1861

A MONSIEUR LE BARON HIPPOLYTE LARREY

INSPECTEUR DU SERVICE DE SANTÉ MILITAIRE

Membre de l'Académie Impériale de Médecine et du Conseil de santé des armées, Chirurgien ordinaire de l'Empereur, Commandeur de l'ordre de la Légion d'honneur, ex-Médecin en chef de l'armée d'Italie, etc.

Monsieur le Baron,

C'est d'après votre conseil que j'ai réuni dans cette notice mes recherches sur l'amélioration des ambulances des armées.

Permettez-moi donc, Monsieur, de vous offrir ce modeste travail comme un témoignage de ma haute estime et de mon respectueux dévouement.

Henri ARRAULT.

NOTICE

sur le

PERFECTIONNEMENT DU MATÉRIEL

DES AMBULANCES VOLANTES

Le programme à suivre pour construire et organiser les ambulances volantes d'une armée, est celui-ci :

« Chercher, par une grande promptitude dans les « secours, le moyen d'abréger les souffrances des « blessés et de leur sauver souvent la vie. »

Or, pour atteindre ce but, il faut :

1° Donner aux ambulances une forme légère qui permette, suivant l'expression de Larrey, *de leur faire suivre tous les mouvements de l'armée ;*

Rendre visibles tous les objets qu'elles renferment et les placer à la portée de la main du chirurgien.

3° Ne laisser dans ces ambulances aucune place perdue : y introduire surtout la plus grande quantité possible de charpie et de linge, en ayant soin de les *comprimer.*

Les ambulances de l'armée réunissent-elles les qualités que nous venons d'indiquer?

Il suffit de jeter un coup d'œil sur ces lourds et embarrassants fourgons à quatre roues, sur ces pesantes cantines de chirurgie cuirassées de fer, pour être assuré du contraire.

Ainsi, en plaçant le fourgon sur quatre roues au lieu de le mettre sur deux, on méconnait cette loi élémentaire de la physique qui dit que plus on multiplie les points de contact d'une machine locomotive, plus il faut employer de force pour la faire mouvoir!...

Ainsi, en se servant de *bois de chêne et de fer* au lieu *d'osier* pour construire les *cantines chirurgicales*, on ne réfléchit pas que si on peut toujours briser ce qui résiste, il est très-difficile de briser ce qui ploie!...

Quant à l'agencement, il n'est pas mieux compris que la forme; et il accuse chez ceux qui s'en sont chargés, la plus complète ignorance des nécessités du champ de bataille, au nombre desquelles l'économie du temps du chirurgien est la plus indispensable et la plus absolue!...

En un mot, tout dans ces ambulances est dans un état de confusion vraiment déplorable.

Le 7 janvier dernier j'avais, sur ce sujet, l'honneur d'écrire à M. le Baron Larrey la lettre suivante :

A Monsieur le baron Larrey.

Monsieur,

Permettez-moi de vous soumettre quelques idees qui m'ont été suggérées par les passages suivants des *Mémoires et Campagnes* de votre illustre père :

Si ces idées sont bonnes et utiles, je vous en laisse le mérite, c'est un bien de famille que je dois respecter.

« Arrivée à Limbourg [1], l'avant-garde aux ordres « du général Houchard, eut à soutenir un combat « assez vif contre celle de l'armée du roi de Prusse.

« L'*éloignement de nos ambulances*, que je dirigeais « en chef, priva une partie des blessés des secours « que leur état exigeait. Les forces supérieures de « l'ennemi forcèrent Houchard à effectuer pendant « la nuit sa retraite, quoiqu'il eût gagné le champ « de bataille.

« Ce fâcheux contre-temps me détermina à pro- « poser au général en chef et au Commissaire « général Villemansy, plein de zèle et de sollicitude « pour cette classe d'infortunés, l'*établissement d'une « ambulance capable de suivre tous les mouvements « de l'avant-garde*.

« Ma proposition fut acceptée, et je fus autorisé à « organiser cette ambulance, que je nommai AMBU- « LANCE VOLANTE. Je conçus alors un système de voi-

[1] Page 64, *Mémoires et Campagnes*.

« *tures* suspendues qui put réunir à la *solidité* la « *célérité* et la *légèreté*.

« Cette institution, ajoute le grand chirurgien, *fit* « *sensation chez nos soldats*, ILS ÉTAIENT TOUS PER- « SUADÉS D'ÊTRE SECOURUS A L'INSTANT MÊME QU'ILS « SERAIENT BLESSÉS.

« Après avoir organisé cette ambulance, je me « rendis avec elle, en vertu des ordres du général « Custine, à l'avant-garde de Houchard, bivouaquée « sur les montagnes d'Oberuchel : elles étaient cou- « vertes de neiges. Houchard devait arrêter, au « défilé de ces montagnes, la colonne ennemie qui « a été déjà désignée. Malgré les rigueurs de la « saison, les soldats de cette avant-garde, composée « en grande partie des premiers volontaires que « Paris avait fournis, étaient décidés à arrêter les « Autrichiens, ou à subir le sort de ces Lacédémo- « niens qui terminèrent si glorieusement leur car- « rière aux Thermopyles; mais l'ennemi, informé de « notre position par un de nos déserteurs, tourna « pendant la nuit le poste que nous occupions, et « nous cerna avec des troupes trois fois plus nom- « breuses que les nôtres.

« Nous vîmes l'instant où nous allions tous périr, « ou devenir prisonniers de guerre, lorsque, par une « manœuvre imprévue et extrêmement habile, Hou- « chard nous sauva du danger. Il fait une trouée sur « un des points faibles de l'armée ennemie, gagne « un terrain favorable à sa retraite qu'il effectue sur « notre corps d'armée, et protége en même temps « la retraite générale.

« Plusieurs de nos compagnons furent tués et nous « eûmes une trentaine de blessés que nous trans- « portâmes avec nous, après les avoir pansés pour « la première fois sur le champ de bataille.

« Ce combat, dont je fus témoin de si près, avait « d'abord fait sur moi une vive impression; mais la « jouissance intérieure que me causa *l'idée du service* « *éminent que venait de rendre à nos blessés ma nou-* « *velle institution, parvint bientôt à éloigner les senti-* « *ments qui m'affectaient, et, depuis ce moment, j'ai* « *toujours vu avec calme les combats et les batailles* « *auxquels j'ai assisté.*

« Lorsqu'une armée est engagée dans des mon- « tagnes, c'est alors qu'il est indispensable d'avoir « des mulets ou des chevaux de bât avec des paniers « pour le transport des appareils à pansements, des « instruments de chirurgie, des médicaments et autres « objets nécessaires aux premiers secours. »

Ainsi, Monsieur, votre illustre père avait tout prévu, tout créé!

Qu'est devenue *son utile institution*, ainsi qu'il l'appelait avec un si légitime orgueil? A-t-elle été perfectionnée, ou bien a-t-elle été amoindrie par ceux qui ont cherché à l'améliorer?

Ces grosses machines, *ces lourds fourgons*, qui suivent si péniblement les armées, sont-ils un progrès sur ces voitures légères qui réunissaient la solidité à la légèreté, qui suivaient facilement tous les mouvements des troupes et qui ont rendu de si éminents services à l'ancienne armée?...

Ces coffres en bois, si lourds de forme et si peu

chargés de linge, remplacent-ils avec avantage ces paniers si légers de forme et si riches d'approvisionnements, dont votre père nous a laissé la description et le dessin ?

Ce sont là, Monsieur, des questions auxquelles je n'ose toucher et dont je laisse la solution à d'autres plus compétents et plus forts que moi. Le seul but que je me suis proposé, en me permettant de vous adresser cette lettre, a été celui-ci :

Par la suppression des ambulances légères à deux roues, j'ai vu ou j'ai cru voir un vide, une lacune faite dans le service chirurgical de l'armée.

Reprenant alors les idées de Larrey, j'ai construit une ambulance volante que j'appellerai *ambulance de régiment*, car elle serait spécialement destinée au service chirurgical de chaque régiment dont elle suivrait tous les mouvements.

Cette ambulance, que l'on place sur un cheval de bât, renferme un approvisionnement en linges, instruments, médicaments, etc., pour 300 blessés, approvisionnement qui m'a paru suffisant pour faire face à toutes les situations, même les plus fâcheuses.

Permettez, Monsieur, quelques réflexions :

Lorsque l'armée a besoin de gibernes, d'épaulettes ou de tout autre objet qui lui est nécessaire, l'Administration de la Guerre a toujours recours à la mise en adjudication, et ne donne la fourniture qu'à celui qui offre la meilleure marchandise et au prix le plus réduit.

Cette règle, dont l'application est si équitable, si rationnelle et si sage, n'a jamais été suivie pour les

fournitures d'ambulances, et cela est fâcheux, car *dans l'émulation est le progrès*, et par *le concours*, qui aurait moins pour but de créer de nouvelles ambulances que de perfectionner celles de l'ancienne armée, le service de santé eût très-certainement obtenu des ambulances commodes, légères, facilement transportables et bien organisées, tandis que le système contraire lui a donné des ambulances incommodes, pesantes, difficiles à mouvoir, mal agencées et qui, si nos renseignements sont exacts, n'ont pas rendu dans nos dernières campagnes, tous les services désirés et attendus.

C'est donc du concours seul que le service chirurgical de l'armée peut espérer obtenir les meilleures ambulances possibles; et comme il n'a jusqu'ici jamais été appliqué, vous rendrez un grand service à l'armée, si vous obtenez, Monsieur, qu'à l'avenir ce concours ait lieu.

Veuillez agréer, Monsieur, etc.

Je désire qu'on ne se méprenne pas sur le sens de mes paroles.

En signalant les imperfections que je crois voir dans les ambulances de l'armée, je ne veux pas dire que je possède le moyen de remédier à toutes ces imperfections.

L'organisation d'un système d'ambulance parfait; mais surtout *le transport des blessés*, sont des pro-

blèmes trop difficiles pour que je prétende en avoir trouvé la solution !...

Cette tâche considérable est au-dessus de mes forces : elle exige des connaissances spéciales que je n'ai pas : à cet égard je me récuse.

Le rôle que j'ambitionne est plus modeste : guidé par l'instinct du bien, je cherche à être utile, et le plus faible contingent fourni par moi dans la solution du problème qui occupe si vivement nos chirurgiens militaires, suffira à mon orgueil !...

C'est dans ce but que je vais faire l'analyse des ambulances officielles et en indiquer les côtés défectueux.

FOURGON D'AMBULANCE RÉGLEMENTAIRE. — Ce fourgon pèse (vide) 1,300 kilogr., et lorsqu'il est rempli, son poids est d'environ 4,000 kilog.

Sa largeur est de 1 mètre 10 cent.

Sa longueur de 3 mètres 10 cent.

Sa hauteur de 80 cent.

Il est monté sur 4 roues.

Il renferme des ressources pour *deux mille pansements* (je prouverai plus loin qu'en utilisant les places perdues, ce fourgon pourrait en contenir pour *six mille pansements*).

Tout le monde est d'accord pour condamner la forme et le poids de ce fourgon. On m'a dit même que, par des retards occasionnés par des accidents de terrain qu'il n'avait pu facilement franchir, il n'avait pas rendu pendant notre glorieuse campagne d'Italie, tous les services qu'on en attendait.

Quant à l'intérieur de ce fourgon, je l'ai déjà dit, il n'est pas plus heureusement organisé. Dans un fourgon d'ambulance intelligemment agencé, aucune place ne doit être perdue : on doit s'attacher à mettre tous les objets sous l'œil et sous la main du chirurgien : on doit encore et surtout fixer les objets de manière à leur éviter des frottements qui pourraient les détruire ou tout au moins les détériorer.

Hé bien, aucune de ces précautions n'a été prise ! *Ici* la charpie et le linge occupent une place *six fois* plus grande que celle qu'il leur faudrait, *si on les avait comprimés* [1].

Là se trouvent pêle-mêle, des *crémaillères*, des *mortiers*, des *marmites*, des *sacs d'outils* qu'on a oublié d'amarrer et qui, pendant les marches, doivent se heurter sans cesse.

Je n'exagère pas : je dis la vérité.

Mais ces *crémaillères*, ces *marmites*, ces *mortiers* etc., se trouvent-ils bien à leur place dans un fourgon d'ambulance destiné à suivre tous les mouvements d'une armée ?...

[1] Voici ce que j'avais l'honneur d'écrire en 1859 à M. le Ministre de la Guerre :

« La charpie est faite communément avec de vieux draps d'hôpitaux ; pour débarrasser *entièrement* ces draps des matières animales dont ils se sont imprégnés, il faudrait, avant de les réduire en charpie, les immerger pendant au moins vingt-quatre heures dans de l'eau saturée de chlore ; on ne le fait jamais, on se contente de les lessiver.

« Aussi arrive-t-il que, sous l'influence d'un air chaud et humide, les matières animales qui ont résisté à l'action de la lessive se décomposent et communiquent à la charpie une odeur désagréable, parfois infecte... Et dans cet état, son emploi ne pourrait-il pas quelquefois donner lieu à des accidents graves ? »

En introduisant dans les ambulances la charpie comprimée on évitera cet inconvénient, car étant ainsi soustraite à l'action décomposante de l'air, elle ne contractera aucune mauvaise odeur.

Ces ustensiles n'étant pas d'une nécessité immédiate sur le terrain et appartenant plutôt aux ambulances de réserve, ne seraient-ils pas mieux placés dans les fourgons servant au transport du matériel?

Les vases en fer battu tiennent dans les fourgons une place très-grande. L'idée que j'ai eue d'en emboîter trente dans un seul, m'a conduit, je crois, à une modification heureuse dans le placement de ces vases, et dont l'utilité sera principalement appréciable pour les petites ambulances.

Pour conclure : le fourgon à quatre roues a fait son temps : Plus embarrassant qu'utile, il doit s'effacer devant le *fourgon Larrey* dont il a, pendant trop longtemps, usurpé la place.

Je vais au devant d'une objection.

Il se présentera bien aussi pour le *fourgon Larrey*, me dira-t-on, des obstacles infranchissables, tels que marais, lieux boisés, pentes rapides, etc?...

Cela est vrai : mais il serait facile de se mettre en garde contre ces éventualités, et d'éviter au service de santé, le moindre retard dans ses approvisionnements.

Pour atteindre ce but, il suffirait, au lieu de mettre pêle-mêle et sans ordre dans des paniers séparés, ainsi qu'on l'a fait pour le fourgon officiel, il suffirait *de réunir tous les objets qui constituent les ressources pour les pansements, et de les placer dans des appareils spéciaux* tels que *cantines, sacs, saccoches, musettes*, qui alors retirés du fourgon, seraient immédiatement confiés à des hommes ou placés sur les chevaux pour les porter là où les besoins du service de santé le demanderaient

CANTINES DE CHIRURGIE RÉGIMENTAIRES. — Des coffres bardés de fer et d'un poids écrasant pour le cheval : des angles aigus et ferrés qui tueraient raide le soldat infirmier, si, par un mouvement brusque du cheval, l'un de ces angles le frappait à la tête : De nombreux tiroirs où sont *cachés* les objets : des linges et de la charpie qui tiendraient dans une place six fois moins grande, s'ils étaient comprimés... en un mot beaucoup de bois et de fer, et relativement peu d'objets à pansements : voilà comment sont conçues ces cantines qui témoignent de l'enfance de l'art.

Ces cantines ont été, du reste, l'objet de plaintes nombreuses : leur insuffisance a frappé depuis longtemps l'administration à laquelle je viens offrir mes nouvelles cantines, dont j'ai parlé plus haut et dont je donnerai plus loin la description.

SAC RÉGIMENTAIRE DE CHIRURGIE. — Le coffre de ce sac est en ferblanc : le bois serait préférable, car outre une légéreté plus grande, il n'a pas, comme le ferblanc, l'inconvénient d'être atteint par la rouille.

Mais une chose à blâmer surtout, c'est la manière dont sont placés les Instruments!... *Roulés ainsi qu'ils sont les uns sur les autres* dans une trousse en peau, ils subissent pendant les marches un frottement continuel qui doit évidemment les endommager.

Il y a plus, la trousse est elle-même, pour eux, une cause non moins grande de détérioration.

Voici pourquoi :

La peau, lorsqu'elle est souvent maniée, devient spongieuse, et dans cet état elle aspire facilement et conserve l'humidité qu'ensuite elle communique aux instruments.

Mais ce n'est pas tout : il est encore, pour les couteaux à amputations, deux autres causes de détérioration : d'abord la gaîne elle-même où ils sont logés, et qui est faite avec un carton grossier dans lequel se trouvent en abondance des substances terreuses sur lesquelles le fil de ces couteaux doit s'émousser; en second lieu, cette gaîne devient une boîte hermétiquement fermée lorsque les couteaux y sont placés : or, comme les préoccupations du chirurgien au milieu de blessés, ne lui donnent pas le loisir de penser aux soins extrêmes de propreté qu'exigent ses instruments, il arrive que les couteaux sont souvent remis dans leurs gaînes encore empreints d'humidité, et alors cette humidité ne trouvant pas d'issue, réagit sur les lames et les oxyde.

Cela me conduit à dire qu'il serait très-utile de joindre à chaque trousse une flanelle fortement imprégnée d'huile inoxydable des horlogers, et dont on se servirait pour graisser les instruments après chaque opération.

PORTE-MANTEAU DE CHIRURGIE. — Ce système de petite ambulance d'escadron serait le meilleur, n'était la difficulté, sinon l'impossibilité pour

le soldat de placer ce porte-manteau à côté de celui qui contient son linge.

C'est à cet inconvénient qu'est due la préférence accordée au système sacoche.

SACOCHES RÉGIMENTAIRES DE CHIRURGIE. — A l'exception de l'enveloppe en cuir, tout dans ces sacoches est à remanier, car tout y est défectueux : les vases, les instruments surtout y sont placés de telle sorte que le moindre choc doit les détériorer ou les briser.

Ces inconvénients du sac et surtout des sacoches, ont été très-souvent signalés par MM. les officiers de santé.

D'après le conseil de M. le baron Larrey j'ai refait cette ambulance, que j'ai mise sous les yeux du Conseil de santé de l'armée : je désire avoir bien compris les renseignements que je tiens de l'extrême obligeance de M. le baron Larrey, et y avoir introduit toutes les améliorations qu'il m'a indiquées!

Je parlerai plus loin de mes sacoches.

MUSETTE OU SAC EN TOILE donné aux soldats infirmiers : cette musette est utile, mais on pourrait la rendre plus utile encore en mettant plus d'ordre dans la disposition des objets, et en en augmentant le nombre et la quantité, sans rendre cette musette plus volumineuse, ce qui serait facile. (Voir plus loin : Gibernes chirurgicales des Brancardiers.)

DESPOTATS OU INFIRMIERS MILITAIRES, chargés jadis d'enlever les blessés du champ de bataille [1]. — Le premier besoin du soldat blessé dans le combat, c'est d'être retiré de la mêlée et transporté dans un lieu où il puisse recevoir sans retard les secours qu'exige sa blessure.

Chez les Grecs on le plaçait sur un char, sur un bouclier, ou sur des lances : les Celtes le mettaient derrière leurs chevaux, les Francs sur leur pavois, les Romains entre leurs bras disposés en forme d'hémicycle; l'on voit par la variété de ce moyen que le salut des blessés dépendait de l'industrie courageuse de ses compagnons.

Mais ce n'est que vers la fin du neuvième siècle, sous l'empereur Léon VI, qu'on trouve des traces évidentes d'une institution spéciale pour cet objet. Dans les armées de ce prince on désignait, en entrant en campagne, huit ou dix hommes par cohorte choisis parmi les soldats les plus agiles : et quelquefois aussi parmi les hommes qui paraissaient le moins propres au service militaire.

Ils n'étaient pas armés : ils marchaient à cent pas derrière leur cohorte respective : leur devoir était d'emmener les blessés. On leur donnait une rétribution pour chaque guerrier qu'ils avaient sauvé; il leur était enjoint d'avoir toujours sur eux un vase rempli d'eau afin d'apaiser la soif et de remédier aux

[1] *Dictionnaire des sciences médicales*, en 60 volumes, article *Despotats*, par Percy.

défaillances que produisent ordinairement les grandes blessures.

Tels furent les Despotats.

L'empereur Léon VI, dans toutes ses instructions à ses généraux, leur recommandait expressément d'avoir de ces hommes secourables, « car rien, disait-il, n'était plus digne de leur vigilance et de leur sollicitude que les vaillants guerriers dont le sang coule pour Dieu, le Prince et la Patrie. »

L'usage du Despotat qui devait avoir été connu avant Léon VI, paraît ne pas s'être soutenu après lui.

Depuis la découverte des armes à feu, la fréquence des mutilations et des fractures fut bien plus grande que lorsque les combats avaient lieu à l'arme blanche. Dans les siècles derniers, on n'avait rien prévu ni rien établi pour retirer les blessés du champ de bataille. Ce n'est que dans les armées plus modernes qu'on a désigné quelques soldats pour porter le linge et les instruments propres à donner les secours les plus urgents. Mais, avant tout, il faut relever les blessés, et on a longtemps reproché aux ambulances dites volantes, de manquer de cette ressource. Ce n'est pas assez qu'il y ait des chirurgiens tout prêts à panser les blessés, il faut encore qu'on les leur apporte à une certaine distance de la ligne, et on n'a mis personne en état de rendre ce service touchant et si essentiel : ce sont toujours les soldats combattants qui le rendent à leurs camarades, en les portant péniblement sur des fusils, dans un manteau ou sur une planche, et l'on sait à combien d'inconvénients cette nécessité donne lieu : le soldat quitte souvent

son rang et la ligne se trouve affaiblie par son absence.

« Tant qu'on eut à l'une de nos armées des chars de chirurgie imités de ceux de l'artillerie légère, sur lesquels l'art de conserver la vie disputait de vitesse et d'activité avec celui de la détruire, on ne vit pas de soldats blessés rapportés par les soldats : des infirmiers militaires qui avaient aussi place sur la bienfaisante voiture, allaient les relever au milieu du feu, et les chargeaient habilement sur des brancards, sans qu'aucun soldat quittât son poste pour les aider et les accompagner. En discontinuant l'usage des corps mobiles de chirurgie (c'est ainsi qu'on appelait ce modèle d'ambulance de bataille) on aurait dû au moins conserver celui des infirmiers porteurs de brancards, et songer à en attacher un certain nombre aux compagnies de soldats d'ambulance. »

Percy était profondément pénétré des services que pourrait rendre à une armée un corps bien organisé de soldats infirmiers : voulant faire jouir de ce bienfait le corps d'armée dont il était le chirurgien en chef, il prit sur lui de créer une compagnie modèle de ces utiles soldats.

Voici comment Percy raconte l'origine de son institution et les obstacles qu'elle rencontra à sa naissance.

« Fatigué, dit le grand chirurgien[1], des désordres sans cesse renaissants causés par cet assemblage dégoûtant d'infirmiers faméliques et vagabonds, rebuté par l'inutilité de mes réclamations, navré de douleur

Laurent. *Vie de Percy.*

de voir mourir sur les champs de bataille un si grand nombre de soldats auxquels on aurait sauvé la vie et conservé les membres à l'aide d'un mode de transport commode et bien organisé[1], ayant vu d'autre part qu'il fallait avoir *le plus près possible des lignes de bataille, des hommes uniquement destinés à relever les blessés plutôt que de laisser ce soin au soldat qui trop souvent saisit cette occasion pour quitter son rang*, je pris sur moi d'organiser un corps régulier de soldats infirmiers, auxquels je donnai le nom de *Compagnies de Brancardiers*.

« Je choisis parmi *les plus courageux, les plus forts* et *les plus adroits*, une centaine de soldats : je les fis habiller, et aussitôt qu'ils furent complètement équipés, je les mis en activité : bientôt le service des blessés et des malades, auparavant si négligé et si abandonné, changea de face. »

« Chacun applaudit à mon institution, ajoute Percy : je rendis compte à l'autorité, des succès obtenus, des services rendus, et, de Madrid où j'étais, j'envoyai comme échantillon, à Paris, une escouade de cette

[1] La même pensée se trouve à la page 57 des *Mémoires et Campagnes*.

« Les règlements militaires, dit Larrey, portaient que les ambulances se tiendraient constamment à une lieue de l'armée. On laissait les blessés sur le champ de bataille jusqu'après le combat, puis on les réunissait dans un local favorable où l'ambulance se rendait aussi promptement qu'il était possible : mais la quantité d'équipages interposés entr'elle et l'armée, et beaucoup d'autres difficultés la retardaient au point qu'elle n'arrivait jamais avant vingt-quatre heures, en sorte que les blessés périssaient faute de secours.

« La prise de Spire nous en ayant donné un assez grand nombre, j'eus la douleur d'en voir mourir plusieurs, victimes de cet inconvénient : *Ce qui me donna l'idée d'établir une nouvelle ambulance qui fût en état de porter de prompts secours* sur le champ de bataille même. »

troupe nouvelle que j'avais habillée et équipée *sans qu'il en coûtât un centime au gouvernement*.

« Mais au lieu de me voir remercier, je fus blâmé ! Mon bataillon eut l'ordre de retourner bien vite à Madrid, et fut dissous : heureusement il avait assez duré *pour ouvrir les yeux* au chef de l'Etat, et mon projet, que des événements politiques firent ajourner, fut définitivement adopté par un décret de 1813. »

Percy a donné sur son institution des renseignements qu'il est utile consigner ici :

« Les compagnies de brancardiers, dit le grand chirurgien[1], doivent être composées d'hommes d'élite, réunissant au courage, la force et l'adresse : car on a besoin d'une certaine habitude pour remuer un blessé, pour le charger sur un brancard et pour le transporter : c'est moins encore par la force que par l'adresse qu'on y réussit, et celle-ci ne s'acquiert que par l'exercice.

« Des porteurs de brancards, en marchant à pas inégaux, secouent douloureusement le blessé : et si ces hommes le jettent brusquement sur le brancard, au lieu de l'y déposer avec douceur, quelles secousses !... quels déchirements l'infortuné n'éprouvera-t-il pas !...

« Mais c'est bien pis encore, quand on est réduit à l'asseoir en travers sur des fusils, ou à le soulever par ses vêtements pour le porter vers l'ambulance.

« Combien de fois, s'écrie Percy, le cœur navré, combien de fois n'ai-je pas vu des officiers et des

[1] Ouvrage cité.

soldats rapportés de cette manière, quelquefois à une demi-lieue de l'endroit où ils étaient tombés !...

« Et, il faut l'avouer, sans ce surcroît de malheurs, un grand nombre de braves militaires eussent conservé leur membre et leur vie même !

« On ne saurait donc trop le répéter : La première consolation et le premier secours que doit recevoir un blessé, *c'est d'être enlevé promptement et commodément*. »

L'institution de Percy fut détruite par la Restauration. Les étrangers s'en sont emparés.

Espérons que, grâce aux dignes successeurs des Percy et des Larrey, l'armée reprendra bientôt possession d'une Institution qui est le fruit de l'expérience et de la méditation d'un des chefs de la chirurgie française, qui fut, comme *Larrey*, le consolateur et le père du soldat !...

BRANCARD DE ARRAULT. — Les brancards ordinaires, dit Percy[1], ne conviennent pas en campagne : il en faut absolument d'autres dont on soit maître de toujours disposer, et que des hommes puissent porter par parties égales aussi facilement que le fusil.

C'est là la première condition à obtenir dans le choix de ces machines.

Les brancardiers doivent à la guerre en avoir constamment les éléments dans leurs mains sans

[1] Ouvrage cité.

dépendre ni des caissons, ni des chevaux de bât, ni du produit éventuel des réquisitions et des hasards de rencontre, sur lesquels c'est un crime de compter quand il s'agit du soulagement ou de l'existence de la classe d'hommes la plus digne de notre prévoyance et de nos secours.

« Un brancard léger, solide, facile à manier, ajoute Percy, sera d'une très-grande utilité : après avoir été employé au transport des blessés, il peut encore servir à coucher ceux qui ont été le plus grièvement atteints. On peut aussi, au besoin, en faire un excellent petit lit de campagne. »

C'est sur ces indications du grand chirurgien que j'ai construit mon brancard, qui se compose :

1° De deux bras articulés se réunissant au moyen d'un fort manchon ou gaine en fer : ainsi placés les bras de ce brancard peuvent mieux se placer dans un fourgon que s'ils étaient d'un seul morceau;

2° De deux traverses en fer qui servent d'écartement : aux deux extrémités de ces traverses on a soudé deux larges douilles en fer dans lesquelles passent les bras du brancard et qui les maintiennent. Ces traverses sont armées de quatre pieds en fer de 30 centimètres de haut sur lesquels repose le brancard;

3° D'un fort filet à mailles larges, et qui a été préféré à la toile pour ce double motif, qu'il est moins altérable à l'humidité et plus léger;

4° De bretelles ou bricoles en buffleterie ayant une largeur de 6 centimètres, et se terminant à gauche et à droite par une anse très-forte.

Ce brancard armé et monté pèse onze kilogrammes et peut porter une charge de deux cents kilogrammes.

C'est chose grave, je le sais, que le changement complet du matériel d'un service. Mais il s'agit ici du sang et de la vie de nos soldats!... Et cela vaut bien la peine qu'on y pense!...

Maintenant, si on vient me dire : mais quelles ambulances proposez-vous donc de mettre à la place de celles que vous trouvez si mauvaises?...

Je répondrai ce que j'ai déjà dit plus haut : mettez en pratique le *Concours*, cette force collective de l'intelligence, et je me présenterai pour la lutte. Je serai certainement très-heureux d'y être victorieux : mais, vaincu, je me consolerai facilement, en pensant que si l'armée possède une chose utile, c'est en partie à mon initiative qu'elle le devra.

En attendant que le *Concours* que je demande, soit officiellement établi, et pour prouver le désir désintéressé que j'ai de voir, *perfectionnée*, l'une des institutions les plus précieuses à l'armée, je donnerai plus loin le dessin et la description du matériel que je propose.

Si les renseignements que je vais donner mettent des concurrents à même de faire mieux que moi, je m'en réjouirai, car, je le répète, j'aurai atteint le but principal que je me suis proposé, celui d'être utile à l'armée!...

J'ai parlé plus haut d'une lettre à M. le baron

Larrey : Cette lettre renferme une idée qui se rattache à mon sujet d'une manière trop intime pour ne pas lui donner place ici.

« On trouve toujours d'utiles enseignements dans « les œuvres d'un homme de génie, avais-je l'hon- « neur d'écrire à M. le baron Larrey.

« La lecture des *Mémoires et Campagnes* de votre « illustre père m'a inspiré les pensées suivantes, « que je vais avoir l'honneur, Monsieur, de vous sou- « mettre :

« L'homme qui, dans un guet-apens, vient de « prendre la vie de son semblable, se place en dehors « du droit commun, en dehors de l'humanité.

« C'est pour qu'un pareil forfait ne reste pas « impuni, que des chefs d'Etat ont fait des lois d'ex- « tradition.

« Eh bien! pourquoi, dans un autre ordre d'idées « et dans un but d'humanité, ces chefs d'Etat ne « diraient-ils pas ceci :

« Du moment où l'arme tombe de ses mains, le « soldat blessé n'a plus d'ennemi : il a droit aux « égards de tous et il devient un objet de secourable « pitié.

« Comme, dans tous les temps et chez tous les « peuples, les chirurgiens militaires n'ont jamais fait « de distinction entre les blessés d'un champ de ba- « taille ; comme, vainqueurs et vaincus ont toujours « des droits égaux à leur humanité, et que, par ce « noble dévouement à leurs semblables, ils comman- « dent à tous l'admiration et le respect...,

« Déclarons qu'à l'avenir :

« 1° Seront regardées comme inviolables les per- « sonnes des chirurgiens militaires ;

« 2° Ne seront plus regardés comme prises de guerre « les fourgons d'ambulances, les ambulances légères « et tous les objets qu'ils renferment : car ce bien est « celui de tous les blessés ;

« 3° Sera regardé comme inviolable et sacré l'en- « droit d'un champ de bataille choisi par les chirur- « giens pour le pansement des blessés ; on y plantera « des drapeaux noirs, comme ceux qu'on place sur les « hôpitaux d'une ville assiégée, et qui diront à tous « que cet asile des nobles souffrances doit être « respecté ;

« 4° Lorsque les chirurgiens d'une armée en « retraite auront remis leurs blessés entre les « mains des chirurgiens de l'armée victorieuse, ils « seront protégés et reconduits dans les rangs de « leurs nationaux avec le respect et la considération « que méritent des hommes qui consacrent et ex- « posent leurs vies pour sauver celles de leurs « semblables ;

« 5° Les soldats infirmiers seront également res- « pectés, et ils suivront leurs chefs ;

« Comme signes distinctifs de leur mission huma- « nitaire, les chirurgiens porteront une écharpe « blanche ou tout autre signe visible qui puisse les « faire immédiatement reconnaître ; etc... »

« J'ignore si de pareils traités internationaux se- « raient facilement réalisables ; mais, s'ils existaient, je « crois qu'ils seraient un éclatant hommage rendu à la

« civilisation, à l'humanité. Je crois que les souve-
« rains s'honoreraient en les signant.

« Reconnaître officiellement la solidarité morale
« qui existe, au point de vue de l'humanité, entre les
« chirurgiens militaires de toutes les nations ;

« Placer ces chirurgiens en dehors de la sphère
« où s'agitent les intérêts et les passions de la poli-
« tique ;

« Détruire les causes qui peuvent les empêcher
« d'accomplir leur sainte mission et *qui les ont forcés*
« *quelquefois à abandonner leurs blessés !...*

« C'est là, Monsieur, une entreprise qui mérite
« d'être tentée! C'est une tâche qui vous appartient !

« Avec le crédit mérité dont vous jouissez près
« d'un puissant Prince, et avec le nom que vous
« portez... entreprendre, c'est réussir ! »

Tout en approuvant mon idée quelques personnes m'ont fait observer qu'elle était reconnue et acceptée par toutes les nations civilisées, et que les chirurgiens militaires n'étaient plus aujourd'hui considérés comme prisonniers de guerre.

C'est beaucoup sans doute et cela fait honneur à la civilisation de notre époque, mais ce n'est pas assez; et il est, je crois, plus sage d'enchaîner la volonté des hommes par un droit écrit, que de se fier à leur générosité qui est mobile et capricieuse comme leurs passions.

Un *contrat synallagmatique entre les souverains*, serait plus fort et plus rassurant *qu'un usage*, et donnerait à l'institution que je propose une auguste sanction, qu'elle ne saurait avoir sans cela.

Que de choses surgiraient de cette institution ainsi placée sous la protection officielle des chefs des peuples !...

Le *chirurgien* deviendrait, sur le champ de bataille, l'objet d'un respect égal à celui dont le prêtre est entouré dans le temple, et il puiserait dans ce respect de tous, le calme, le sang-froid et la force nécessaire, sans lesquels il ne pourra jamais qu'incomplètement remplir sa mission.

Le *soldat* verrait ses souffrances amoindries ;

Sa vie mieux protégée ;

Son moral raffermi !...

Ce serait en vérité un bien splendide spectacle que cette réunion de deux corps de chirurgiens militaires échangeant entr'eux ces paroles sur un champ de bataille :

« Nous vous remettons nos blessés qui sont vos frères comme vos blessés sont les nôtres ! »

Ce serait la plus magnifique application de ces paroles de Christ : *Aimez-vous, secourez-vous les uns les autres !*

Si je me laisse bercer par des illusions, si je fais un rêve, je demande qu'on ne me réveille pas !

HENRI ARRAULT.

Paris, ce 10 Juin 1861.

NOUVEAU MATÉRIEL D'AMBULANCES

par

HENRI ARRAULT

Ambulances-cantines vétérinaires en usage dans l'armée française. (Voir dessin n° 1.)

CES CANTINES SE COMPOSENT :

1° D'une carcasse en osier tressé et recouvert extérieurement et intérieurement d'une couche d'étoupes maintenues par une toile ;

2° D'un casier mobile en bois mince, mais fortifié par l'application, sur toute sa surface, d'une toile enduite de colle-forte. Dans ce casier, chaque flacon est maintenu par deux tasseaux en cuir qui reposent sur son épaulement, et l'empêchent de remuer, *quelle que soit la secousse imprimée à la cantine ;*

3° D'une enveloppe en fort cuir de vache.

Ces ambulances-cantines réunissent surtout deux avantages que les hommes spéciaux apprécieront :

1° LA LÉGÈRETÉ. (Voir plus loin leur poids) ;

2° LA SOLIDITÉ. En présence de la Commission d'examen, le modèle déposé au Ministère de la guerre fut, sur la demande de l'inventeur, jeté du premier étage de la caserne du quai d'Orsay, avec les flacons pleins, les instruments, médicaments et accessoires sans qu'il résultât de cette épreuve la moindre avarie.

Dimension. — Haut. 52 c., larg. 62 c., épaiss. 32 c.

Poids brut des deux cantines complètes : 80 kilog.

CANTINES A ET B

Elles renferment :

			kil.	gram.	
1	flacon en verre roulocé,	petite ouver.	»	30	pierre infernale.
1	—	—	—	»	250 solutté d'azotate d'argent au 30e
1	—	—	large id.	»	250 sulfate de zinc.
1	— en ferblanc,	petite id.	»	200	teinture d'extrait d'opium.
1	—	—	—	»	100 éther sulfurique.
1	—	—	—	»	100 teinture d'aloès.
1	—	—	—	»	500 teinture de cantharides.
1	—	—	—	»	500 kermès.
1	—	—	—	»	500 térébenthine.
1	—	—	—	»	500 extrait de gentiane.
1	—	—	—	»	500 pommade mercurielle.
1	boîte	—	—	1	» cantharides pulvérisées.
1	flacon	—	—	1	» goudron.
1	—	—	—	1	» camphre.
1	boîte	—	—	1	» pommade populeum.
1	—	—	—	1	» onguent de laurier.
1	flacon	—	—	2	» pommade à vésicatoire.
1	—	—	petite	2	» essence de térébenthine.

Nota. Tous les bouchons en liége des flacons sont coiffés d'une capsule et d'un anneau en fer galvanisé.

OBJETS DIVERS

Une lampe à laquelle sont soudées quatre têtes de compas pour recevoir un vase de la contenance de deux litres d'eau. Cette lampe, avec laquelle on peut obtenir en quelques minutes de l'eau à 40 degrés, peut être utile dans les marches en été, époque de l'année où sont fréquentes les tranchées, les congestions, etc., accidents contre lesquels un lavement est souvent très-efficace.

Nota. Cette lampe est disposée de telle sorte qu'elle peut être utilisée, soit avec de l'alcool ou de l'huile, soit avec une bougie.

1 vase de 2 litres.
1 queue mobile s'adaptant au vase.
1 support pour le vase.
2 spatules en bois.
1 mesure graduée pour doser les liquides.
1 mesure pour doser les poudres.

Nota. A ces deux mesures est joint un tableau synoptique qui indique le poids relatif des substances qu'elles peuvent contenir.

2 kilog. d'étoupes.
1 seringue en étain pour un lavement.
1 — pour injections.
1 pelotte garnie de 200 épingles fortes.

Ambulances-cantines de Arrault, pour le service de santé d'un régiment. (Voir dessin n° 2.)

Nous nous sommes placé au point de vue d'un champ de bataille. Nous avons disposé *tous* les objets que renferment ces ambulances de manière que le chirurgien puisse voir et prendre sans perte aucune de temps le médicament, l'instrument ou le linge à pansement dont il peut avoir besoin.

Les cases des deux cantines sont de la même dimension, de sorte que les flacons de la cantine A pourront au besoin être substitués à ceux de la cantine B, ce qui permettra de rétablir l'équilibre entre elles en faisant une égale répartition des flacons pleins et vides.

Dimension. — Larg. 58 c., haut. 55 c., épaiss. 32 c.
Poids des 2 cantines complètes, 80 kilog.

CANTINES A ET B

Elles renferment :

INSTRUMENTS

2 boîtes en noyer, à coins en cuivre contenant :
2 scies à amputation avec 2 lames de rechange.
14 bistouris.
2 pinces à esquilles.
2 — à artères.
2 — tire-balles.
2 paires de ciseaux.
24 lancettes dans deux lancetiers.
24 aiguilles à sutures assorties.
2 compresseurs.
4 dés à coudre.
2 sondes œsophagiennes en gomme [1].
6 sondes ordinaires.
6 bougies.

Tous ces instruments sont faits sur les modèles de la guerre.

LINGES A PANSEMENTS

14 kilog. de charpie *comprimée*.
14 kilog. de linge de corps et de compresses, comprimé moitié en toile de coton, moitié en toile de fil.

1 Pour empêcher que la chaleur les fasse adhérer entr'elles, ces sondes ont été placées séparément et dans des tuyaux métalliques.

200 bandes de linge en toile de fil et de calicot, de 3 mètres sur 5 centimètres.
500 grammes d'agaric.

OBJETS DIVERS

60 vases en fer blanc emboîtés les uns dans les autres, pesant ensemble 2 kilogr. 900 et n'occupant dans les cantines qu'une place de 31 centimètres de diamètre sur 8 centimètres de hauteur. Cette disposition particulière des vases qui permet d'en mettre une aussi grande quantité dans un si petit espace, ne sera pas une des moindres utilités de ces cantines.

1 lampe (voir sac chirurgical, pour la description de cette lampe).
6 pièces de rubans.
4 bougies filées.
4 morceaux de cire pour cirer le fil.
4 crayons.
24 bouchons de rechange.
44 attelles.
20 — articulées pour fractures de cuisses.
12 éponges fines.
2 écheveaux de fil ciré.
12 — de fil.
4 ventouses.
2 seringues (modèle Charrière).
2 mesures graduées pour doser les liquides.
4 spatules en bois.
4 boîtes d'allumettes.
300 épingles.
25 aiguilles à coudre.
2 tire-bouchons.

MÉDICAMENTS

500 paquets de 2 décig. de sulfate de quinine.
500 — 1 — d'émétique.
24 bandes de toile hémostatique de 1 mèt. sur 10 c.
250 gr. de laudanum en 2 flacons en verre.
250 — ammoniaque en 2 flacons en verre.
500 — éther sulfurique en 2 flacons en ferblanc.
2 kilog. d'huile d'olives en 2 flacons en ferblanc
2 kilog. d'alcool camphré en 2 flacons en ferblanc.

Observations. — Comme nous avons voulu faire de ces cantines une réserve pour les sacs chirurgicaux, nous n'avons pas cru devoir y mettre des médicaments autres que ceux qui entrent dans la composition de ces derniers, suivant l'ordonnance ministérielle de 1839.

Sac d'ambulance pour l'infanterie. (Voir dessin n° 3.)

Il renferme :

MÉDICAMENTS

1 flacon de 60 gr. d'alcool camphré.
1 — 60 — d'huile d'olives.
1 — 60 — d'éther sulfurique alcoolisé.
1 — 30 — de laudanum de Sydenham.
1 — 30 — ammoniaque liquide.
20 paquets de sulfate de quinine de 2 décig.
20 — d'émétique — de 1 —
2 mètres de sparadrap.
4 — de toile hémostatique de Arrault.

Cette toile hémostatique est plus adhérente que le sparadrap, et facilite mieux que lui le travail de la cicatrisation, elle est aussi d'un emploi plus facile; pour s'en servir, on l'humecte comme on fait du taffetas d'Angleterre.

Dans les cas de fractures, d'entorses, etc., on peut faire un bandage d'une très grande solidité au moyen de lanières de 4 à 5 centimètres de cette toile que l'on trempe pendant quelques secondes dans de l'eau et que l'on roule ensuite autour du membre luxé ou fracturé.

La solidité du bandage sera, bien entendu, en raison directe de la quantité de bandes de toile hémostatique superposées.

S'il est besoin de défaire un appareil, il suffira de l'humecter avec une éponge imbibée d'eau chaude à 40 degrés environ, pour qu'il puisse être enlevé sans effort et sans douleur aucune pour le blessé.

Cette toile hémostatique est préparée avec une teinture éthérée de myrrhe et d'aloës.

INSTRUMENTS

1 scie à amputation avec lame de rechange.
2 bistouris, dont un convexe.
1 pince tire-balles.
1 — à esquilles.
1 — à artères.
1 paire de ciseaux.
2 couteaux à amputation, dont 1 inter-osseux.
1 sonde œsophagienne en gomme élastique.
1 — pour l'urètre — —
1 bougie — — —
6 aiguilles a sutures

LINGES A PANSEMENTS

350 grammes de charpie.
21 compresses en toile de fil et coton.
1 linge de corps.
3 serre-tête.
16 bandes de trois mètres sur 6 centimètres.
1 morceau d'agaric.
8 attelles, dont 2 articulées.

OBJETS DIVERS

1 ventouse.
1 éponge fine.
5 gobelets.
1 lampe sur laquelle s'adapte les gobelets et à l'aide de la quelle on peut obtenir en quelques minutes de l'eau chaude
12 aiguilles à coudre.
200 épingles fortes.
1 écheveau de fil.
1 morceau de cire.
1 bougeoir, 1 bougie en cire et 1 briquet.
1 spatule en buis.
1 dé à coudre.
1 pièce de ruban.

Observations. — Par la simplicité de sa construction, ce sac chirurgical est d'un maniement facile : en l'ouvrant, le chirurgien a sous les yeux *tous les objets qu'il renferme ;* il peut prendre immédiatement l'instrument ou le médicament dont il a besoin..., avantage inappréciable, surtout dans un cas d'hémorrhagie, où la vie d'un blessé tient à des secondes!. .

Quant aux instruments, il a été pris toutes les précautions nécessaires pour leur conservation : chacun d'eux a sa case particulière, où il est fixé au moyen d'une bande en caoutchouc, et il n'y a pas de crainte à avoir sur leur détérioration, qui est si prompte dans les trousses comme dans les sacs régimentaires, où les instruments sont roulés les uns sur les autres, et où ils subissent un frottement perpétuel pendant les marches.

Dans l'un des en-bouts qui ferme le rouleau qui surmonte ce sac il y a une petite lampe et un vase en ferblanc à l'aide desquels on peut avoir en quelques minutes de l'eau chaude à quarante degrés

Cette lampe a été, sous le rapport de son utilité, l'objet d'éloges flatteurs pour nous de la part d'hommes spéciaux. On comprend, en effet, quels services elle peut rendre en campagne, surtout dans ce cas de blessures où un bandage durci par du sang coagulé a besoin d'être changé : avec de l'eau chaude, ce bandage, promptement ramolli, sera défait sans souffrance aucune pour le blessé.

Cette lampe est disposée de telle sorte qu'elle peut être mise en activité, soit par de l'huile ou de l'alcool, soit par une chandelle ou une bougie.

Porte-manteau d'ambulance pour la cavalerie. (Voir dessin n° 4.)

Ce porte-manteau renferme les mêmes instruments, médicaments pièces à pansements, que le sac d'ambulance précité.

Porte-manteau vétérinaire d'escadron. (Voir dessin n° 5.)

Ce porte-manteau peut rendre de grands services dans les manœuvres, dans les marches où on ne peut emporter les cantines renferme tout ce dont peut avoir besoin le médecin vétérinaire dans les cas imprévus.

MÉDICAMENTS

1 flacon en ferblanc de 400 grammes d'alcool camphré.
1 pot en ferblanc de 400 grammes d'onguent populeum.

OBJETS DIVERS

1 mètre de toile de coton.
1 pièce de ruban.
200 grammes d'étoupes.
100 épingles fortes.
4 aiguilles à coudre.
Fil.
1 dé à coudre.
1 spatule en buis.

Une trousse contenant :

INSTRUMENTS

1 flamme double.
1 aiguille à sétons.
1 paire de ciseaux.
1 bistouri droit.
1 — convexe
1 pince à dents de souris.
1 feuille de sauge double.

Sacoches chirurgicales. (Voir dessin n° 6.)

Ces sacoches chirurgicales renferment les mêmes objets a pansements, instruments, etc., que le sac chirurgical : il y a de plus ans ces sacoches une seringue modèle Charrière, et une série de 14 gobelets en ferblanc.

Ces sacoches se composent :

1° De deux poches en fort cuir de vache, disposées de manière à ne laisser aucune humidité pénétrer dans leur intérieur, et armées de courroies en nombre suffisant pour attacher solidement les sacoches au bât du cheval;

2° De deux boîtes en noyer, renfermant l'*une* les instruments et les linges à pansements, l'*autre* les médicaments et objets divers désignés dans l'ordonnance ministérielle de 1839.

Dans ces sacoches comme dans toutes mes autres ambulances, je me suis attaché d'abord à perdre le moins de place possible, ensuite à rendre visibles et à placer ainsi sous la main du chirurgien tous les objets qu'elles renferment, etc., enfin à mettre ces objets, les instruments surtout, dans les meilleures conditions de conservation possible.

Giberne chirurgicale et nécessaire de l'officier en campagne. (Voir dessin n° 7.)

Un chirurgien étant absent..., mettre MM. les officiers à même :

1° De faire le premier pansement d'une blessure;

2° De poser un appareil provisoire sur une fracture;

3° D'arrêter une hémorrhagie;

4° D'éloigner d'un blessé, par des soins donnés à propos, tout accident formidable jusqu'au moment où il pourra être remis entre les mains d'un chirurgien;

5° D'être des auxiliaires précieux dans ces circonstances malheureuses où, en présence d'un grand nombre de blessés, MM. les chirurgiens ont la douleur de se voir insuffisants;

6° De rendre surtout d'immenses services dans ces cas de blessures graves reçues aux avants-postes, loin de tout secours, et où un *pansement immédiatement fait* peut conserver un membre à un soldat, lui sauver la vie même!

Telle est la tâche que nous nous sommes proposée en créant cette giberne et en écrivant le petit guide chirurgical qui l'accompagne.

MM. les officiers nous sauront très-certainement gré de l'avoir entreprise, car nous savons l'étroite solidarité qui existe dans l'armée, et combien est grande leur sollicitude pour leurs soldats!

L'usage du revolver étant adopté par nos officiers de marine, nous avons pensé rendre notre giberne d'une utilité plus grande encore en y réservant une place pour 18 cartouches.

Notre giberne renferme les objets suivants :

1 flacon de 15 grammes, de teinture de perchlorure de fer.
1 flacon de 15 grammes d'alcali volatil.
20 paquets de 1 décigramme de sulfate de quinine.
20 paquets de 1 décigramme d'émétique.
6 mètres sur 5 centimètres, de toile hémostatique.
1 bande de calicot, de 6 mètres sur 5 centimètres de largeur.
32 grammes de charpie.
1 bistouri à coulant.
1 pince à épines, pouvant au besoin servir de pince à artère.
1 pinceau à cautériser.
1 lancette.
1 paire de ciseaux.
1 écheveau de fil ciré.
1 écheveau de fil gris.
1 écheveau de fil rouge.
1 écheveau de fil noir.
6 aiguilles à coudre.
1 aiguille à suture.
12 boutons en os.
1 alène et fil de cordonnier.
1 guide chirurgical.

La giberne s'attache au ceinturon du sabre au moyen d'un crochet : Entièrement garnie, elle ne pèse que 500 grammes.

Giberne chirurgicale des brancardiers remplaçant la musette.

DIMENSION :

40 cent. longueur. — 13 cent. largeur. — 11 cent. hauteur.

1 sonde cannelée.
1 pince tire-balle.
1 paire de ciseaux.
1 compresseur.
1 flat de cave.
1 lancetier et 6 lancettes.
1 flacon de 125 grammes de perchlorure de fer.
1 — 125 — alcool camphré.
12 bandes de 3 mètres sur 4 centimètres.
20 compresses.
10 mètres toile adhésive.
2 serre-tête.
1 linge de corps.
3 attelles.
Charpie pour combler les vides.
200 épingles.
12 aiguilles à coudre.
30 grammes d'agaric.
6 aiguilles à sutures.*

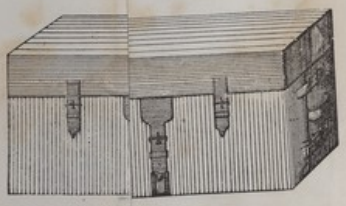
Nouveau brancard articulé de Arrault. (Voir dessin n° 8.)

Voir, pour la description de ce brancard, les pages 25, 26 et 27.

10,035. — ABBEVILLE, IMP. R. HOUSSE

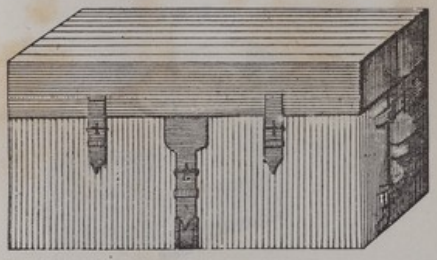
Dessin n° 2.

B



Dessin n° 1.

A



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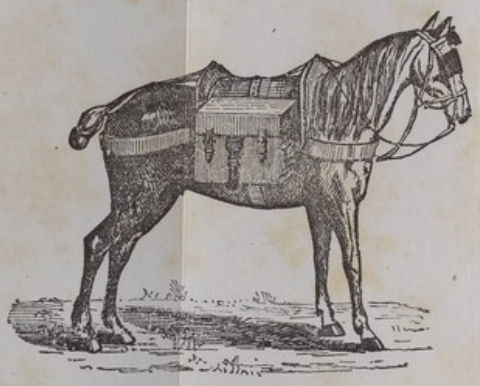

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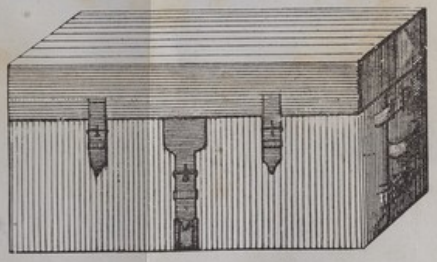

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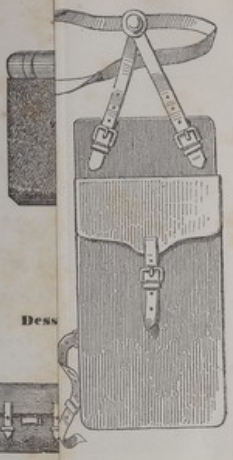
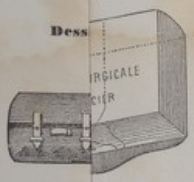


Dess

[illegible] n° 7.

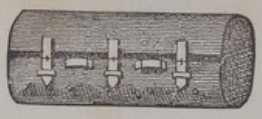
Dess



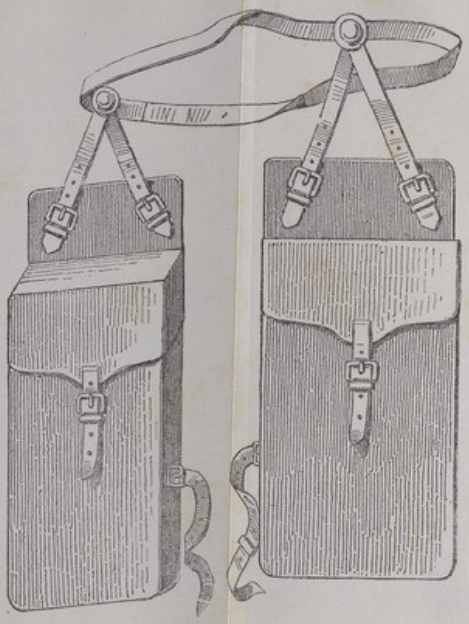
Dessin n° 3.

Dessin n° 4.

Dessin n° 5.



Dessin n° 6.



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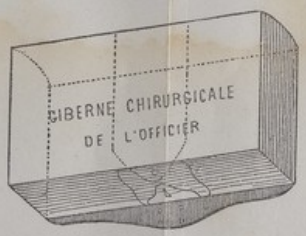


AAAA. Bra

BB. Sup

CC. Croch

DD. Toile
ven
cha

EE. Barre
tem

FFF. Filet
le c
les

NNNN. Ans
après les
que côté
et le tend

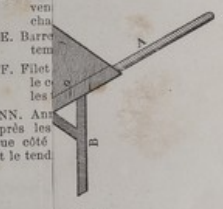
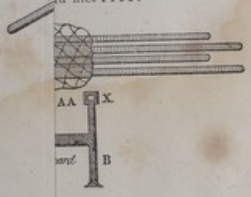


Fig. 2.

ntés et enveloppés des 2 toiles
lu filet FFFF.



DESSIN N° 8.

AAAA. Bras en bois entrant l'un dans l'autre et s'y fixant au moyen de 2 crochets CC.

BB. Supports ou pieds en fer mi-plat glissant sur les bras AA au moyen d'un œil XX jusqu'au point d'arrêt OOOO.

CC. Crochets servant à maintenir les bras AA. Fig. 2.

DD. Toile très-forte destinée à supporter la tête et les pieds du blessé et venant resserrer les bras AA au moyen de 3 fortes courroies de chaque côté de la toile.

EE. Barres de fer mi-plat sur champ maintenant l'écartement des pieds BB.

FFF. Filet en forte corde pour supporter le corps et venant se tendre après les toiles DD et les bras AA.

NNNN. Anneaux en fer cousus après les toiles DD de chaque côté du filet pour le fixer et le tendre à volonté.

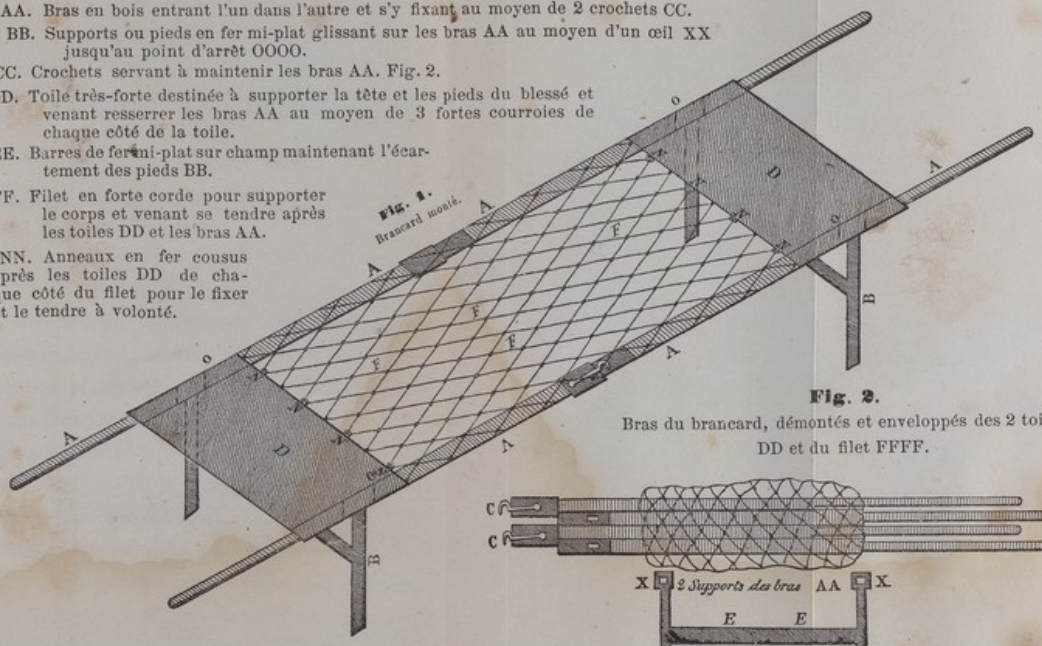


Fig. 1.
Brancard monté.

Fig. 2.
Bras du brancard, démontés et enveloppés des 2 toiles DD et du filet FFFF.

Fig. 3.

HOSPITAL SERVICE

OF THE

FRENCH ARMY IN THE EAST.

(*Translated from the* MONITEUR DE L'ARMÉE *of the 20th of October.*)

THE *Journal des Debats*, quoting the correspondents of English newspapers, gave us two days back a painfully interesting narrative of the sufferings to which the wounded in Lord Raglan's army had been subjected, as well as the wounded Russians entrusted to the care of that army. When we recollect the attention that is bestowed by our neighbours on the other side of the channel, upon every necessity of the soldier, and even on superfluities for his comfort (*confort*), it is impossible to deny that the serious inconveniences pointed out in the accounts that have just been made public, are the results of an improperly adjusted financial arrangement, or of a negligence that painfully contrasts with that liberality which is the characteristic of the English administration of the affairs of the army and navy.

On the other hand, but a few months since, the organiza-

tion of the English medical and hospital service, was cited as a model for our imitation: our attention was especially directed to the fact that the English military surgeons had complete control over everything that related to the supplies and to the administration of their hospitals, and that as a consequence all would go on admirably well; and persons were not wanting who wished, when the question of re-organizing our medical staff was raised, that we should adopt this plan, so perfect, and so precise in its workings.

If affairs are really so well ordered in England, and if the reports that have arrived from the East are correct, we are forced to come to the conclusion that the English medical pre-arrangements were insufficient, not only in respect to the staff attached to the army, but also in regard to dressings, and to the material, and means of transport. In short, what would have been the result if a sudden hurricane had arisen, and separated the English even for a short time from their ships; if, in the absence of litters, the brave sailors had not been present to offer their oars; and if, moreover, their wounded countrymen had not found on the decks of these vessels an asylum, and some attention, though, as we see in the accounts of the overcrowding of the wounded, very incomplete!

It is consoling to the relatives of the brave soldiers of France, to find by the side of this recital of the sufferings which have weighed so cruelly upon the English army, evidence of the active and intelligent care which has preserved our own wounded. Thanks to the admirable organization of ambulances and hospitals in the medical service

amongst our troops, no sooner does a man struck in the ranks fall, than he is carried to the rear, where the regimental medical officer (*officier de santé regimentale*) pays the first attention to his wounds by the aid of the dressings which are at hand in charge of a soldier. If it is a severe wound, the sufferer is led or carried to the provisional post, where the chests of the regimental ambulance are established, and, if necessary, to the ambulance of the division. A sufficient number of attendant soldiers (*soldats infirmiers*), of seats (*cacolets*) fixed on pack-saddles borne by mules, are always in readiness to carry the wounded from the field of battle, and convey them to this ambulance, under the immediate direction of the officers of administration entrusted with that duty, and under the active *surveillance* of the deputy military intendant, in whose hands this important part of the duties of the administrative service is placed.

The English surgeons, it would appear, do not sufficiently appreciate the advantages presented by this plan of removing and transporting the wounded. They prefer to *cacolets*, which have answered so admirably in Africa, and which are at this moment doing such good service in the East, a species of ambulance waggon, upon which the London press, some few months since, delivered a pompous eulogy. We have seen a coloured plan of this carriage, and we are far from allowing it the merit which has generally been attributed to it.

The front part, divided from the rest like the *coupé* of our public conveyances, holds three sick men * who are capable of

* This is a mistake; the front part holds six, instead of three men.

sitting upright, but the seats are placed sideways, as in omnibuses. The back part of the waggon is arranged for the reception of four sick or wounded men, who are laid horizontally on frames made to slide in like drawers: two being placed at the bottom of the carriage, and the two others above, an arrangement similar to the berths in steam-boats.

This painful method * of transporting the sick soldier presents a number of inconveniences, especially for those placed in the lower frames. Moreover, the waggon cannot turn in every direction with the same facility as our pack-saddle mules; and thus the latter are infinitely superior in the field of battle, and also in a mountainous country, or in one which is difficult of access.

In our army, when it is required to transport such of the sick as a horizontal position is necessary to, litters are employed, which are also carried by mules. For the discharge of the sick and wounded from the provisional ambulance into

* It is very evident that the writer of this article had never seen the waggon which he professes to describe with so much accuracy, or he would not have used the expression "*painful method*." All means which human ingenuity could devise were employed, in order to obtain an easy motion; and it was acknowledged by all those persons who subjected themselves to the experiment of being conveyed in the waggons that Mr. Holmes, the well-known carriage-builder, had been eminently successful in his efforts.

The writer also shows that he was unacquainted with the construction and capabilities of the vehicle, when, in the next paragraph, he gives it to be understood, at least by implication, that the wounded transported therein will be denied the benefit of pure air and daylight—an impossibility, inasmuch as each compartment is fitted with a Venetian shutter, extending its entire length, so that the interior may be aired and lighted to any extent that is considered desirable.

a regular hospital, our military waggons (*caissons*), hung on springs, are employed, with still more success than the English vehicle; for in ours, the sick soldier has at least the benefit of pure air and daylight.

We have said that at all times the attendant soldiers (*soldats infirmiers*) remove the wounded from the field of battle under the direction of the officers of administration for the hospital service, and under the *surveillance* of the deputy military intendants; and we think that a few more special particulars on this important subject will not be out of place here.

In our army, the surgeons are not required to burden themselves with any care relative to the organization and administration of the material of the hospitals and ambulances. Devoted entirely to the exercise of their noble calling, they practise it with a power the most supreme. The dispenser is at their side, ready to make up their pharmaceutical prescriptions; the officer of administration directs the employment of the material, and carries out alimentary prescriptions, of which he bears the responsibility.

The *infirmiers* (attendants), selected from the best-intentioned men amongst the troops, or from the young soldiers of the annual contingent, previously instructed in the military hospitals in all the duties of the holy mission which is entrusted to them, are all men of intelligence and feeling, all robust and well-framed: they are really the choice soldiers (*soldats de l'élite*).

Over all these, is the superintending military officer (*officier de l'intendance militaire*), who, according to the

orders which have been transmitted to him, directs the movement of the staff and the material of the ambulance, and orders the wounded to the temporary or permanent hospitals established by the military administrative, which are likewise under his authority.

In this organization, as complete as it possibly can be, every one has his share of action, of authority, and of responsibility. The man of science, as he should be, is the absolute master at the bedside of the sick. The dispenser and administrative officer, whilst they are called upon to comply with the prescriptions of the surgeon within such limits as the regulations have marked out, are, however, in no way subordinate to his authority, for they are both of them accountable and responsible. If they are involved in doubts, or disputes, they must refer to the deputy military intendant, whose decision is law to each.

Hitherto the *service*, and that is the essential, has worked well in France under these regulations of duties, against which only a few irritable grumblers have raised their voices. Let us compare the results in the two armies, and then pronounce an opinion on the respective merits of the two systems that are followed.

We will complete our explanations by giving a rapid summary of the resources which our military administrative has allotted to the army in the East, for carrying out the hospital arrangements.

Each corps possesses a surgeon and an assistant-surgeon, who have at their disposal for each battalion, or for two squadrons, an ambulance bag (*sac*), capable of being carried

wherever it is most needed, and a pair of chests furnished with drugs, lint, and everything necessary for the treatment of two hundred wounded.

If the corps makes any prolonged stay in camp, or elsewhere, a regimental infirmary is formed, and the magazines of reserve furnish for that purpose all the elements of organization.

Each division, or each detached brigade possesses, in addition, and in conjunction with the materials above mentioned, a regular ambulance, the materials of which belonging to two different sources, have been combined upon the spot, by the competent authority, in such a manner as to answer to the wants of the regiment consequent upon the greater or lesser amount of movement in the corps forming the division, or the detached brigade.

One of these sources is the organization of the ambulance of the army of Africa, the *materiel* of which is transported on the backs of mules; the other is the organization of the regular ambulances borne on waggons. In the combination of these two means, the latter serves as a reserve to the former, and is more particularly attached to the service of the advance post, or of the first line. The conjunction of these waggons forms a species of temporary hospital.

The moveable ambulance of Africa for a division of ten thousand men is composed of the following staff and material:—

Staff in its different ranks.

16 Surgeons and Dispensers.
7 Officers of Administration.
104 Hospital Attendants (*Infirmiers*).

Material.

8 Surgical chests, each containing 338 dressings.
4 Medical chests for drugs.
4 Chests of administration for material.
18 Reserve chests for the service of health.
22 Chests for the administrative service.
26 Chests (personal), for medical and administrative officers, &c.
10 Casks of Ptizan.
20 Hand litters (*brancards*).
200 Blankets.
50 Cart tilts for the sick, &c. (*bâches pour les malades, &c.*)
30 Tents.
24 Litters.
250 Pairs of seats (*cacolets*).

The whole resources amount to 6,500 dressings, distributed in the various chests for actual use, and in those of the reserve. The transport of all this material requires 364 pack-saddle mules.

The material of a regular ambulance for a division of ten thousand men is composed of five waggons, each carrying 2,000 dressings, and all the elements of a small hospital. The ambulance of a division of cavalry is only composed of three waggons. Each waggon is drawn by four horses.

The military administration of the army in the East possesses twenty-five waggons of ambulance so furnished.

To sum up, the total medical and hospital staff attached to the French army in the East is composed of—

276 Surgeons and Dispensers.
54 Officers of Administration.
50 Sisters of Charity (nurses for hospitals).
751 Infirmiers.

With respect to the material, independently of the resources of the interior service of the corps, and active ambulances, there has been already despatched from France, for the establishment of permanent hospitals at different places, a complete material for 7,700 sick; and this is irrespective of the establishment of a hospital at the Piræus, capable of accommodating five hundred sick. At the present time, a complete material for the organization of two new hospitals, for the reception of five hundred sick each, is being despatched; five hundred being the number chosen to represent the unity of each hospital. In short, large reserves of various objects have been organized, and more especially dressings.

With the aid of these supplies, we may reckon upon resources sufficient to provide 200,000 dressings. Nevertheless, from day to day ships leave France, to the reserve store established at Constantinople, with new supplies for the use of the service.

In the first instance, 1,000 iron bedsteads only were sent out, the temporary hospitals merely carrying mattresses, furnished with sheets, coverlids, &c.; but in consequence of successive supplies, the number of iron bedsteads amounts at present to 4,000, and will soon reach 8,000 or 10,000; so that the hospitals in the East have no cause to envy those of Europe.

The dispensing service is organized in the same manner as the administration, and is provided not only with drugs, but also with every material that is requisite. A central depôt, established at Constantinople, is furnished with every provision for replenishing the local stores.

The arrangements made for some years past by the military administration for regulating the method of packing the different classes of *materiel* required for hospital service, gives moreover every facility for determining before-hand the nature and importance of the means of transport required by each supply. The dimensions, the contents, and the weight, of each case are settled, hence results great facility for the rapid and sure despatch of this material. Thus, for a temporary hospital of five hundred sick, are required:—

Administrative material in all, 55 metres cube.* Total weight, 15,000 kilogrammes.†

Pharmaceutical material in all, 9 metres cube. Total weight, 1,800 kilogrammes.

Every hospital of five hundred sick is provided with drugs for three months.

As for the alimentary requisites, which the administration of the hospitals procures in a great measure upon the spot, the central administration occupies itself with the means of procuring for the sick a proper allowance of such special food as agrees with them, by establishing at the reserve depôt at Constantinople considerable stores of vegetables, preserved by Chollet's process.

* A metre is 39·3702 inches.

† A kilogramme is 2 lbs. 3 oz. 5 dwts. 13 gr. avoirdupois.

These details, the interest of which will doubtless excuse their length, bear the highest testimony to the enlightened care bestowed by his Excellency the Minister at War upon the perfect performance of the important duties of the hospitals, and upon the health of the troops, an object of constant solicitude to the Emperor. They prove, also, that the administration of war in all its movements justifies the confidence of the minister, and that in that respect, also, it is enabled to present to foreign armies some principles worthy of imitation, and examples worthy to be followed.

HAUSSMAN.

Printed by STEWART and MURRAY, Old Bailey.

SIR JOHN HALL'S REJOINDER

TO

DR. SUTHERLAND'S REPLY

TO HIS

OBSERVATIONS

ON

THE REPORT OF THE SANITARY COMMISSIONERS,

AT

THE SEAT OF WAR IN THE EAST,

IN

1855 AND 1856.

LONDON:
PRINTED AND PUBLISHED BY
W. CLOWES & SONS, 14, CHARING CROSS.
1858.

REJOINDER.

It is neither my wish, nor my intention to enter at length into the Reply which Dr. Sutherland has made to my remarks on the Report of the Sanitary Commissioners in the Crimea; but, as some of his observations, if allowed to remain unexplained, would give an erroneous impression to the reader, I feel called on to advert to them, and in doing so, as the Doctor has disclaimed all idea of personality, I beg he will receive what I am about to say with the same feeling of charity that his own remarks were written in.

No one, I believe, undervalues the importance of sanitary arrangements either on service in the field, or in the fixed abodes of man; and few, I think, would deny the advantage of admitting a course of instruction on public health into the curriculum of education of all medical men, whether civil or military. But if Dr. Sutherland means it to be inferred, from what he states, that knowledge of this kind is confined to a few individuals, the profession at large, I imagine, would demur to such a doctrine, for no one can study the medical profession properly without becoming acquainted with the laws of health, as well as of disease; and the technicalities of what is termed sanitary science may be easily and readily obtained from the epitomised editions of the Health of Towns Report, and the suggestions arising therefrom, which individuals have favoured the world with in popular forms. It was to these I referred in my observations, and I am sorry they do not meet with the Doctor's approbation, which I thought they would have done, considering the apparently extensive use he has made of them, and of the writings of military authors, in his sanitary recommendations.

So much importance do I attach to sanitary instruction, that I would not only admit it into the curriculum of medical education, but I would make it obligatory on all staff officers of the army to attend a course of such lectures; and, I think, a plain code of instructions for the management of health might be drawn up with advantage for the guidance of the private soldiers, as, I understand, is the practice in some of the continental armies.

These instructions should be read and explained to the men by their officers, or, what would, perhaps, answer as well or better, they might be printed in their small account books for easy reference.

This discussion, however, is not of any importance. The main question, and the one which interests the British public, is whether the labours of Dr. Sutherland, and the other highly paid Sanitary Commissioners, with their expensive train of inspectors and scavengers, who were sent out to the East in 1855, were essentially necessary to the welfare of the army in the Crimea, and whether the sickness and mortality of the troops there were in any appreciable degree affected by their labours. I say no, and in this opinion I think I shall be joined by most men who served there.

The Commissioners arrived at Balaklava at the end of March 1855, when the difficulties the army had laboured under during the winter were being rapidly surmounted, and when health was returning to its ranks with the genial weather of spring; and, in my opinion, the result would have been equally favourable had they never set foot there. Their labours were confined principally to Balaklava; and with plenty of time on their hands, and means placed at their disposal, it was not not very difficult for them to give a creditable detail in their Report of so many basket or hand-barrowfuls of dirt taken from one place and thrown into another, of so many stercoraceous deposits scented out on the hill sides, behind old walls and buildings, and in the neighbouring ravines, and of so many paunches of animals fished out of the harbour and disposed of. In fact, when the Commissioner mounts his sewage cheval he rides full tilt, and won't even look at the humble labours of his neighbours.

Dr. Sutherland, in his reply to my observations, is cynical about my recorded sanitary labours; but I beg to remind him that many suggestions are made by the principal medical officer of an army on service in the field to the general in command, which are never committed to writing, and he forgets that the daily detail of management and supply of all the hospitals in the Crimea, which at one time amounted to nearly 100, had to be attended to by me. This duty occupied much of my time, and was a constant source of toil and anxiety to me; and if he will permit me I will contrast it with his more agreeable position, as detailed in the following extract from a letter, written by a gentleman who was intimately associated with him for some time after his arrival in Balaklava:—"I look on Dr. Sutherland and the Commission as the same body virtually. Having messed and

associated with that individual for some weeks on his first arrival in the Crimea, I am enabled to give some of his impressions with respect to the sanitary state of our army. I judge from what dropped from his own lips, in conversation with myself and others. When well, he was talkative and communicative, with a disposition to look upon matters in rather an exaggerated and sentimental light. He was so engaged in writing in his cabin on board the 'Walmer Castle' when the cholera broke out and gave just cause for alarm, that even the captain and officers of the ship exclaimed—'Of what use is this man?'

"The weather was fine in April, when I and others used to take our evening walk to Kadekoi, and stroll over the ground where Dr. Sutherland says that he saw human bodies buried almost in water, and so sparingly covered with earth that even their remains protruded through the surface. This statement I condemn as a —— ——, and an insult to our common sense feeling of decency, and I cannot conceive how Dr. Sutherland could dare to publish it in his Report."

Dr. Sutherland, at page 31 of his reply, states that the Sanitary Report does not say anything about the burial of the dead from the hospitals in the British burial-ground at the head of Balaklava harbour; but as that was the burial-ground of all who died in hospital there during part of the winter of 1854-5, if the Report does not allude to them, to whom does it allude?

Again, at page 22, he says, "The Military Board of Health alludes to the unhealthy condition of the Turkish burial-ground above the head of the harbour, but does not mention the far worse condition of the British burial-ground."

The Military Board of Health did not advert to the British burial-ground in their Report, as they, like many thousand others who passed along the road close to it daily, failed to discover what Dr. Sutherland has described in his Report; and, I think, few men would have hazarded so bold an assertion as that given at the close of the above sentence. The Turkish burial-ground at the head of the harbour had been the subject of a special inquiry on account of its offensive condition, arising from the number of bodies deposited in it, and the superficial manner in which they were buried, and it was ordered to be closed, and the graves covered over with additional earth mixed with quick lime, which was carried into effect before the arrival of the Sanitary Commissioners, though I see they take credit for doing something of the same kind, without making any allusion to the previous labours of the military authorities. It is but fair to assume, had the British burial-ground been in the condition described by

Dr. Sutherland, it must have attracted the attention of either the Board of Mixed Officers appointed to inquire into the condition of the Turkish graveyard, which was not more than 150 yards from it, or the Special Military Medical Board of Health, as neither of them had any object to attain by concealing the circumstance, if the graveyard were in the state described by Dr. Sutherland.

This graveyard, which is put so prominently forward in Dr. Sutherland's Report and Reply, was a slip of ground by the road side at the head of the harbour, distant, I should say at a guess, about 250 yards from the general hospital. It was of small extent, and was only used during part of the winter, as the dead were buried at the foot of the vineyard, in front of the general hospital, when the army first took possession of Balaklava; and early in the spring of 1855, they were taken to a new burial-ground, about a quarter of a mile beyond the village of Kadekoi.

The piece of ground at the head of Balaklava harbour, in part of which the dead from the hospital were buried, and on which the Sanitary Commissioners expended so much of their labour, did not measure more than about 100 yards from the water of the harbour to the bridge over the small brook up the valley, and about as many from the road on the eastern side of the valley to where the brook discharged itself into the harbour originally, but a more direct course was cut for it afterwards to drain the valley of Balaklava. This piece of ground, which formed a truncated cone, was miry for some distance from the water of the harbour, and required an immense amount of labour and material to render it fit to erect wharves and storehouses on, which was eventually done, and they were of great convenience to the commerce of the port, but of insignificant importance to the health of Balaklava. The main trunk drain originally recommended by me—recommended again by the Military Board of Health, and finally cut the whole length of the valley to Kadekoi, was a measure of greater sanitary importance to the neighbouring camps than the petty sewage of the small village of Balaklava, to which the commissioners devoted so much of their time and attention, and from which Dr. Sutherland draws such exaggerated and erroneous conclusions, as I shall make manifest by and by.

Balaklava,

which has been raised to the dignity of a small town by the Sanitary Commissioners, is a mere fishing village, the male inhabitants of which fled on its being taken possession of by the English, and the women and children were removed shortly afterwards, by order of the Commander-in-Chief. Balaklava had the defects of all Eastern villages; and during the wet weather of the winter of 1854-5, the main street and quay, which were unpaved, became, from the constant traffic of men and animals, almost impassable.

Dr. Sutherland says, a sanitory police should have been established for the health of the troops in occupation, immediately the *town* was taken possession of. Now, as there were no troops in occupation of the place in the first instance, beyond a few invalids encamped near the general hospital, and as not a single soldier could be spared from his immediate and proper duty in front, and there were no civil inhabitants in the place, I should like to ask him how he would have managed to carry the measure out had he been there? I admit the advantage of a sanitary police in towns, but there was no means of carrying it into effect at Balaklava during the winter of 1854-5. It is true I might have made a written representation to the Commander-in-Chief, and put on record, as the term then was, my opinion on the subject; but knowing Lord Raglan's disposition to do all in his power for the good of the soldiers under his command, and knowing his inability to spare a single man at the time, I did not think it right to embarrass him by doing so.

In November, the sick of the Turkish army took possession of a number of houses in the village, and an effort was made to obtain Turkish soldiers for the sanitary affairs of Balaklava, and some were granted in November by the Pasha in command of the nearest Turkish camp; but the men were disgusted with the employment, and the prejudices of their faith rendered it still more irksome to them under Christian command, so that little good was effected by the measure. Any one who has ever served with an allied army, where the supreme command is not vested in one person, will readily understand the difficulty that was experienced in dealing with that part of the village which was occupied by the Turks; but after the arrival of the 71st Regiment, in Dec. 1854, some progress was made in repairing the streets and quay, but it was slow work, as the men had neither hand-carts nor barrows, and they were compelled to carry the stones in their hands. Fortunately, the cold of winter prevented any injurious effects from the filthy state of Balaklava; and when the Turkish sick were removed out of the place, immediate steps were taken to purify the houses they had occupied by lime-washing. About this time the railway navvies began to pull down houses to form the line of rail which ran through two-thirds of the village, and when the Sanitary Commissioners arrived at Balaklava at the end

of March 1855, these operations were in progress. The streets and quays were being repaired by the debris of the houses pulled down by the railway navvies, and Lieut.-Colonel Hardinge, the active and intelligent commandant of the place, was using energetic means to remove the accumulated dirt, not of six months, as stated by Dr. Sutherland, but of years, and in due course of time it would have been accomplished, and wharves would have been built, and other improvements carried out if the Commissioners had never arrived.

Dr. Sutherland himself must have been impressed with this idea, for when applied to in his capacity of Sanitary Commissioner about an accumulation of dirt near some huts that were occupied by native drivers and railway navvies, he referred the applicant to the commandant, observing, to the amazement of several persons who were present, that he had nothing whatever to do with the removal of nuisances. At a subsequent period the commandant, I was told, had even to remonstrate with the Sanitary Commissioners concerning the filth which had been allowed to accumulate in the immediate neighbourhood of their own dwelling.

At page 28, in his reply, Dr. Sutherland states, "That the bad sanitary condition of the town and harbour of Balaklava and their vicinity, was the cause of much sickness in the town, on board ship, and in the neighbouring camps." This is a broad assertion of the doctor's, which is unsupported by experience, for it is well known that the troops encamped around Balaklava were infinitely healthier than those in front during the whole of the winter and spring of 1854-5, and at that period the place was certainly in its worst sanitary condition, so far as mud and other impurities were concerned, but the cold of winter rendered them in a great measure innocuous, so that the statement may be taken as a mere assumption on the part of Dr. Sutherland; and to prove that privation, exposure to inclement weather, and excessive duty, were the main causes of disease in the British army, one need only contrast a division encamped in front with one encamped in the immediate vicinity of Balaklava during the winter of 1854-5. Or what would be still more to the point, the 71st Regiment might be taken as an example, the reserve battalion of which, 417 strong, arrived from England at Balaklava about the middle of December 1854, and was landed and encamped at the head of the harbour for nine or ten days, when it was brought into the village, and quartered in houses and tents near the general hospital. In February, the 1st battalion, 473 strong, joined at Balaklava from Corfu, and the whole regiment was hutted in a

ravine above 250 yards above the head of the harbour, leading to the eastern heights of Balaklava, and remained there until the month of May, when it embarked with the expedition for Kertch. During the months of December 1854, and January 1855, only two deaths are returned in the regimental monthly sick returns, and as these were both from cholera, I apprehend their sick must have been treated and accounted for in the general hospital at Balaklava.

In February 1855, when their own regimental hospital was established, the surgeon returns 87 admissions and 5 deaths, out of a strength of 890 men; in March, 143 admissions and 5 deaths; and in April, 101 admissions and 4 deaths. In May the regiment embarked for Kertch.

The improvement in health of the brigade of Guards, which was brought down from the plateau in front of Sebastopol to the western heights of Balaklava, towards the end of February 1855, was very marked indeed; but as the health of the whole army was at that time beginning to improve, the same importance cannot be attached to this instance as to the cases of the regiments that were encamped near Balaklava during the whole winter; and I will merely give as an example the admissions and deaths in the Guards during January 1855, the month before they came down to Balaklava from the plateau in front of Sebastopol, and during the month of March, the month after their arrival on the western heights of Balaklava.

			Strength.	Admissions.	Deaths.
On Plateau before Sebastopol.	January, 1855,	Grenadier Guards .	415	268	26
	"	Coldstream Guards	429	182	35
	"	Fusilier Guards .	530	169	34
			1374	619	95
	Being a ratio of Admissions to strength per month of				45·05 per cent.
	And of Deaths to strength		"		6·91 per cent.
On Western Heights of Balaklava.	March, 1855,	Grenadier Guards .	325	68	0
	"	Coldstream Guards	326	101	10
	"	Fusilier Guards . .	725	106	2
			1376	275	12
	Being a ratio of Admissions to strength per month of				19·98 per cent.
	And of Deaths to strength		"		0·08 per cent.

The sickness and mortality in the Coldstream Guards were increased during the month of March by their occupation of some huts at the head of the harbour, near the Turkish burial-ground, which had been objected to by me, and there some cases of spotted

typhus fever occurred amongst the men before they were removed to the heights above.

The health of a wing of the 2nd battalion Rifle Brigade, which was quartered on the eastern heights of Balaklava during the winter, was comparatively good, while the other wing, which was stationed on the plateau in front of Sebastopol, suffered severely. The wing above Balaklava, which was 321 strong, lost only two men by disease during the quarter ending 31st March, 1855. One, a case of dysentery, and the other a case of apoplexy.

The light division, (which was encamped on the plateau in front of Sebastopol, had a fair share of the toil and privation which the army underwent during the winter of 1854-5, and was not more unhealthy than its neighbours,) may be contrasted with the cavalry division which was encamped in the Kadekoi valley, and two troops of horse artillery, one of which was encamped with the cavalry division in the Kadekoi valley, and the other close to Balaklava.

In the month of December, the cavalry division, consisting of the 4th and 5th Dragoon Guards, 1st, 2nd, and 6th Dragoons, 4th and 13th Light Dragoons, 8th and 11th Hussars, and 17th Lancers and C and I troops of Horse Artillery,

Out of a strength of .	2586	Admitted	750	and Lost	16	by Death.
1855 January . .	2434	„	537	„	16	„
„ February . .	2328	„	330	„	20	„
„ March . .	2268	„	274	„	11	„
	9616		1891		63	

which gives a ratio of 78.66 per cent. of admissions to mean strength, and of 2.62 per cent. of deaths to mean strength, during the four months; but it must be borne in mind that these regimental returns merely embrace the medical transactions in the Crimea, and do not include the deaths in general hospital at Scutari. The same rule applies to the following statement, regarding the light division for the same period.

Regiments:—7th Fusiliers; 19th Regiment; 23rd Fusiliers; 33rd Foot; 34th Foot; 77th Foot; 88th Foot; 90th Foot; left wing 2nd Battalion Rifle Brigade; and, in February and March, the 97th Foot.

December, 1854 . . .	Strength	5090	Admitted	1663	Died 258
January, 1855 . . .	„	5061	„	1742	„ 305
February, „ . . .	„	5337	„	1327	„ 182
March, „ . . .	„	5391	„	851	„ 97
		20879		5583	842

which gives a ratio of 106.95 per cent. of admissions to the mean strength, and of 16·13 per cent. of deaths to mean strength.

I have entered more at length into this subject than may be deemed necessary by some; but I was anxious to show that dirty as Balaklava was, it was not, even during the very worst period of its wretchedness, the focus of disease that has been represented by Dr. Sutherland in his Report and Reply. Nor can I believe he could ever have seriously thought it was so, or he would never have permitted the Army Works Corps to place one of their hutted encampments in the bed of the Balaklava valley, not more than 200 or 250 yards from the head of the harbour, and close to the Turkish and British burial-grounds, which have been so graphically described by him. It was not only near to these two burial-grounds, but close to, if not partly on, the burial-ground which was used by the Turks for a time after that at the head of the harbour had been closed in consequence of the Report of the Mixed Board which was assembled to take its condition into consideration. The encampment of the Army Works Corps was, in my opinion, placed in about as objectionable a site as it was possible to select; and I remember recommending the medical officer in charge to protest against its continuance. The medical officers of the Army Works Corps were not placed under my direction, nor did they report to me for the Commander-in-Chief's information, until March 1856, and beyond supplying their wants from the general medical stores of the army, I had no control over them; but on one occasion I recollect the medical officer in charge of the encampment complaining to me of the amount of sickness in the division, and my remarking I was not surprised at it from the site of their camp, which was in every way objectionable, and he ought to protest against it.

Now, it may be fairly asked, what could the Sanitary Commissioner have been thinking of to permit such a contradiction to his own expressed opinion to be carried out under his very eyes? I challenge him to produce anything more at variance with the laws of sanitary science in the whole army arrangements than this was; and in this case there was not even the plea of necessity to be advanced, as the Army Works Corps were not, like the army, compelled to be placed wherever military reasons required them.

At page 24 of his Reply, Dr. Sutherland says, "The country occupied by the allied forces at the commencement of the siege operations had been several times described by travellers and residents as peculiarly unhealthy, and their descriptions would certainly have led civilians to have adopted more than ordinary sanitary precautions in such a country."

This sentence must have been written for mere effect, as Dr. Sutherland cannot surely mean seriously to assert, that the ground occupied by the allied army before Sebastopol was peculiarly unhealthy. He knows, or ought to know, perfectly well that it was not so; and lamentable as the condition of the British army encamped there was in the winter of 1854-5, it was not owing to locality, or want of ordinary camp sanitary arrangements, which were enjoined by General Order, and in force when the army took post there, but to the depressing effects of constant exposure to wet, inclement weather, want of proper clothing, fuel, and shelter, and excessive duty, and insufficient means of cooking the rations which were issued to the men. These were the true sources of disease in the British army in the Crimea, and they were pointed out by me to Lord Raglan as early as November 1854, in as forcible language as I could use. I not only pointed them out, but I ventured to predict the result that would probably ensue if immediate measures were not taken to remedy them. I received for answer, through the Adjutant-General, "that Lord Raglan was as well aware of the condition of the army as I was," and General Estcourt added, "there are only two courses open to us in our present position, either to abandon the siege altogether for a time, or to conduct it with a certain loss of human life until the defects you mention are removed." During the hardships of the winter of 1854-5, when it was a bare struggle for existence with every one, ordinary camp regulations were to a certain extent overlooked in the general misery, and perhaps this was a circumstance of little importance so long as the country remained locked up in frost and snow; but immediately there was an appearance of open weather, I deemed it expedient to call attention to the necessary sanitary rules in camp, which were in abeyance, and the letter of the 24th January, 1855, to the Adjutant-General, at which Dr. Sutherland sneers, was written.

The doctor says, that as the country had been described by travellers and residents, as peculiarly unhealthy, more than ordinary precautions should have been taken. I admit this, if it had been found to be so on our arrival, but such was not the case. I had no means of access to the works of travellers. I was not certain the army was going to the Crimea until near the period of its embarkation, and I had no time to spare from important daily pressing duties, to draw up theoretical instructions to meet imaginary contingencies; but I did what was a better thing, I placed at the disposal of the medical officers of the army the following works, which had been considerately sent out for their instruction by the Director-General of the Army Medical

Department, and I informed them by a department circular memorandum, in November 1854, that any officer who chose to apply at the medical store, would be supplied with a copy of any one, or all of them:—

"On Premonitory Diarrhœa in Cholera, by Dr. M'Lauglin."
"On the Diseases in Turkey, in reference to European Troops, by Dr. Shulkof."
"On the Personnel and Materiel for an Army of 30,000 men sent out to Turkey."
"On some Specialities in the Remittent Fever of the Levant, by Dr. Bryce."
"On the Prophylactic Influence of Quinine, by Dr. Byrson and Mr. Drummond."

It must be borne in mind, when the army landed in the Crimea, it was generally believed that an attempt would be made to carry Sebastopol by a *coup de main*; and when it broke ground before the place, no one supposed the town would hold out more than a week, and until after the battle of Inkerman, on the 5th of November, few had any idea the army would have to winter on the plateau in front of Sebastopol. It was certainly very inadequately provided for such an undertaking; even the elements warred against the enterprise, and the result was very disastrous. I was absent from the Crimea from the 1st to the 23rd of October, 1854, but Dr. Dumbruck, an active, intelligent, and very energetic officer, who officiated as principal medical officer in my absence, did all in his power to further the sanitary concerns of the army; but the power of military medical officers in such matters, as is well known, is limited to suggestions and recommendations. They are not accompanied by engineers, inspectors of nuisances, and scavengers, as Dr. Sutherland was, or they would in all probability have effected as much as he did, had they been invested with the same power; but even he, I suspect, would have accomplished little, had he arrived in the first bustle of disembarkation and military preparation, when every man in the army was fully occupied with his own duties, and civilians could not be obtained for either love or money; indeed, judging from what I saw of Dr. Sutherland in comparatively quiet times, I think he would have been as helpless as any man breathing under such circumstances.

At page 21, Dr. Sutherland says, "The next sanitary proceeding was in some respects a remarkable one, both as regards the time when it took place, and the result of it. The commission of Sir John M'Neill and Colonel Tulloch, with the Sanitary

Commissioners, arrived at Constantinople on board the French mail packet, on 6th of March, 1855, and on the 8th Dr. Hall recommended Lord Raglan to appoint a Board of Health, to consider the sanitary state of the army." The inference here implied I do not object to. It is a legitimate deduction from what was stated in my observations, but it is not correct for all that. Sanitary matters had, long previous to the appointment of that board, been the subject of official correspondence with the Director-General of the Army Medical Department, and of consultation and correspondence with the military authorities on the spot, as far back as August 1854. It was in consequence of the conflicting opinions of medical officers, elicited in collecting material to enable me to furnish the statement Dr. Smith requested in January 1855, that I came to the conclusion, the general and uniform sanitary arrangements of the army would be most effectually secured by a board of superior medical officers assembled by order of the Commander-in-Chief, the proceedings of which, if approved by him, would have the support of his authority. Under this impression, my letter of the 8th of March, 1855, was written; but at that time I was not aware of the arrival of the Sanitary Commissioners at Constantinople on the 6th of the month, nor indeed, do I even think that I had then heard of their appointment, so that their arrival at a distant port could not possibly have influenced my application to the Commander-in-Chief. In my observations at page 52, there is an error in the date of the arrival of the Sanitary Commissioners at Scutari, which I beg to correct; it ought to have been the 6th of March, 1855, instead of the 26th, as printed in the observations.

At page 18, in his Reply, Dr. Sutherland makes a greater mistake than this, about the period of signing the armistice with Russia, and in his anxiety to convict me of error, he departs from his usual courteous and guarded style of writing, and indulges in stronger expressions than the case exactly merits. I stated in my observations, "that it appeared the privies themselves at Scutari were left in their original state, until March and April 1856, when, after the armistice with Russia had been signed, and it was known to all the world that peace would be proclaimed, they were fitted with patent water-closets, which was a wanton waste of public money." Dr. Sutherland says, this is "simply contrary to fact." "The original state of the drainage was improved twelve months before, by temporary means well known to sanitary engineers, and the first soil-pans were put up in February 1856, while the real fact being, that the armistice was agreed to in the middle of March." Unfortunately for the

doctor's *real fact*, the armistice was agreed to early in February 1856, and was officially notified to the army in the Crimea on the 28th of that month. My observations had reference solely to the privies within the hospitals, and not to the hogsheads placed outside the walls of the building for flushing the drains, and it scarcely merited the harsh term applied to it, as I meant one thing and Dr. Sutherland another. With regard to the patent water-closets, I admit having overlooked the following observation in Mr. Unsworth's Journal, of work performed at Scutari, during the month of February 1856. "Some of the private quarters, at the barrack hospital, were provided with soil-pans and flushing cisterns, and *six* soil-pans were also fixed at the south-west angle of the barrack hospital, with a supply of water from the Turkish cistern." These, though overlooked by me, were not put up until after the armistice had been agreed to, on the 1st of February.

In his Journal for March 1856, Mr. Unsworth says, "At the barrack hospital thirty-six soil-pans with new seat boards, and six urinals, were put up in the north-east angle of the building; down pipes and stench traps being also provided."

In the month of April 1856, when peace had actually been proclaimed, Mr. Unsworth continues:—"During the month of April, the greater part of the labour at the disposal of the Sanitary Commission was employed *in replacing the Turkish privies* at the barrack hospital with soil-pans, with the requisite fittings, and connections to afford them a good and plentiful supply of water." If this, considering that active measures were then being taken to remove the sick from the hospital as speedily as possible, without any chance of their being replaced by others from the Crimea, does not prove a useless and extravagant waste of public money, I have nothing further to say.

At pages 25 and 26, in his Reply, Dr. Sutherland says the Commissioners recommended "surface draining of the ground around huts, ridge pole ventilation, and lime-washing all huts externally to keep them cool." "The plan proposed for ventilating huts by louvered turrets, which was well carried out by Dr. Alexander in some hospitals in the light division, we have described and figured in our Report as the best method we found in use, although we recommended ventilation by raising the ridge boards of the huts instead, as being simpler."

The drainage of huts and tents had been adopted from the commencement of the campaign, and the temporary expedient of piling stones or earth against the huts when they were first erected, was to prevent them from being blown over by the wind, and

perhaps more importance has been attached by the Commissioners to this plan than it merits, for the interior of the huts was influenced more by the surface drainage, than by this expedient, which was continued to the very last without much detriment to the men's health. This plan of external protection to the huts was not only continued, but during the winter of 1855-6 it was much extended, and many huts were cased with rough masonry up to their very eaves, to the comfort, not detriment, of their inmates.

The plan of lime-washing the huts, recommended by the Sanitary Commissioners, was mischievous in its results, as it destroyed the texture of the felt covering, and rendered them leaky. Having this probable result in view, and conceiving that the temperature of the huts depended as much on the free circulation of air through them as on the colour of their roofs, I made that objection to the Commissioners' plan, when it was submitted for my opinion by the Quarter-Master-General.

The louvre turreted plan of ventilation, which was carried out in the light division by Mr. Alexander, and figured in the Commissioners' Report, was recommended by the Military Board of Health, and the ridge board plan, which Dr. Sutherland says the Commissioners recommended to be adopted, was also actually in use on their arrival in the Crimea; and Dr. Jephson, surgeon at present of the 1st King's Dragoon Guards, who suggested it from what he had seen at one of the hill stations in India, will be astonished at the doctor's assumption of credit for a recommendation that is due to himself. It is the more surprising that Dr. Sutherland should have overlooked this mode of hut ventilation, as it was adopted first at the castle hospital, Balaklava, where he had many opportunities of seeing it.

At page 32, in his Reply, Dr. Sutherland says, "The Commissioners are called to account for making certain suppositious statements, in regard to the general hospital in camp, which they are not aware exists in their Report. The condition of the ground and of the huts at the date when the inspection was made, was such as they have described."

This may be true, but the Commissioners must have selected the period when the huts, which composed the general hospital, were in a transition state from barrack to hospital use, and they must have wilfully shut their eyes to their improved condition, whenever they passed them afterwards. Their Report was not published until the spring of 1857, two years after the event described; and although the statement served well enough to make a point in it, it was neither just nor generous to resort to such an expedient, to the prejudice of their professional brethren in the

army: but as they have spoken of the undrained and imperfectly ventilated condition of these huts, we will see what the opinion of the civil surgeons employed in the general hospital was. These gentlemen are all eminent in their profession, they are men of high honour, and have no interest in the question beyond the cause of truth, and they write as follows to Mr. Mount, who was the principal medical officer of the establishment. Civil surgeon Dr. Macleod says:—"As to the question of ventilation, I may remark, that if by good ventilation is meant a free supply of air, then the arrangement at the general hospital could not be complained of, as though the urgency of the service often forced us to admit into our wards many more patients than any of us would have countenanced, except as a matter of necessity, still by means of the apertures cut in the walls, and the numerous holes and crannies which existed between the planks, together with the high position of the hospital, a deficiency of air was not felt."

Dr. Lyons, pathologist to the army in the East, says, "In reply to your letter of the 11th June, 1857, asking my opinion respecting the condition of the hospital huts of the general hospital in camp before Sebastopol, as to ventilation, I do not know whether I could add anything to what I have already stated in my Report to Lord Panmure (at p. 101). Having had opportunities of observing the arrangements of this hospital after the affairs of the 7th and 18th of June, 8th of September, 15th of November, and all intermediate periods, I cannot conceive that *want of ventilation* should be at all urged as a charge against the huts in question. The fragility of their construction rendered them almost self-ventilating; and independently of this, I am aware that particular attention was directed by you, and all the medical officers of the hospital, to the establishment of free ventilation, by the removal of plankings here and there, and the construction of valvular flaps. By these, and similar means, much was done towards mitigating the effects of the excessive temperature of the hot summer months of the Crimea. I have already borne my testimony officially to the great success attending the treatment of the wounded in the English hospitals, and the absence of gangrene in any epidemic form." Mr. Rooke, civil surgeon, says, "I have great pleasure in answering your questions concerning the efficiency of the general hospital in camp in the Crimea, of which you were principal medical officer. As I was appointed one of the surgeons of your medical staff before any patient had been received into the hospital, and having remained on duty until it was broken up, a period of more than twelve months, I may, without presumption, say that I had the

best opportunity of judging of the arrangements you made for the reception of the wounded,—the measures you adopted for the proper ventilation of the hospital huts, and of the unwearied zeal you daily evinced for the well-doing of the patients. I can bear my testimony to the healthy state, and efficient arrangements of the hospital with the greater pleasure, that being now unconnected with the military medical service, it cannot be supposed that any approbation I may express, is given in order to stand well with the powers that be. I can truly state that you availed yourself of every means in your power to make the huts as suitable as such buildings could be for the reception of the wounded. That the ventilation of the huts was not deficient, is sufficiently proved by the almost total absence of erysipelas in the hospital. After the affair of the 18th of June, I had a larger number of wounded under my care, than any other medical officer. Those whose wounds were not fatal, mostly remained until they were convalescent, a period of several weeks. I had not a single case of erysipelas attacking a wound, or following an operation, nor after the attack of the 8th of September, although my patients were as numerous as those of the other medical officers. The circulation of air through the huts was constant. I never found my wards close or disagreeable, even when all the beds were full." Such is the honourable testimony borne by these gentlemen to the condition of the general hospital in camp, and it may be well contrasted with the Sanitary Commissioners' paltry subterfuge to throw discredit on the medical department of the army. But it is in keeping with the tenor of both his Report and Reply, which are written with a species of special pleading cunning, which is intended to damn by implication, rather than by direct open manly accusation. It was not creditable for the Commissioner to creep into men's confidence, by professions of friendship and approbation, and then to throw them aside when it suited his purpose to do so.

At page 32 of his Reply, Dr. Sutherland says, I have made an unfounded statement about the two letters he wrote to me on the 16th May, 1855, concerning the removal of the Buffs, 48th and 71st Regiments, to new encamping ground, and the early treatment of the diarrhœal stage of cholera. I do not exactly know what he means by using such a term, as I merely stated his letter of the 16th May, 1855, recommending measures that he saw being carried out on the 14th, could only have been written *pro forma*, so far as the removal of the camps was concerned; and as I had mentioned to him the precautions I had recommended on the 30th April, 1855, to be observed by medical officers for

the detection and treatment of cholera in its diarrhœal stage, his second letter, and the only one to which he alludes in his reply, appeared to me to be equally written *pro forma*, as the measures he recommended were inapplicable to the circumstances of the case. At page 35, Dr. Sutherland insinuates that he had been misinformed by me regarding the measures directed to be taken for the detection of cholera amongst the men. I may therefore be permitted to quote part of a Medical Department Order, which I issued on the 22nd July, 1854, when cholera first broke out in Bulgaria. The first portion of the order relates to the distribution and use of cholera belts, which it is not of importance to insert here; but the part which I wish to quote is as follows, and was addressed to the principal medical officers of divisions:—"I beg you will be careful that medical officers of corps, now that cholera unhappily prevails, *make diligent inquiry daily* about the health of the men, and endeavour to impress on them the importance of immediately reporting any looseness of their bowels, and applying for appropriate remedies for checking it." Again, on the 30th April, 1855, when cholera re-appeared in the Crimea, the following circular memorandum was issued by me to all superintending medical officers:—"As cases of spasmodic cholera have occurred in different quarters within the last week or ten days, Dr. Hall requests superintending medical officers will call the attention of regimental medical officers to the subject in a manner not to create alarm, but sufficiently explicit to put them on their guard. It is of the utmost importance not to allow the first, or diarrhœal, stage to pass over without treatment, for if collapse once set in the result is doubtful, whereas in the diarrhœal stage it is for the most part amenable to medical treatment."

There was no reluctance on the part of the men to report their ailments, and the plan, without creating unnecessary alarm, was found to work well,—better, certainly, than that of frequent additional parades for inspection, recommended, I dare say, with the best intention by Dr. Sutherland and others, would have done, for the doctor is mistaken if he thinks suggestions to Government on sanitary matters were confined to himself and the other Sanitary Commissioners. They were not so, and the following extract from a paper of suggestions, sent out by authority, will show that the doctor's own sewage routine is viewed in pretty much the same light that he sees the sanitary labours of the medical officers of the army:—"The public is aware that a sanitary commission has been sent out to investigate the state of the hospitals at Scutari, and to employ scavengers to cleanse the camp at the Crimea. It is not our object to criticise the appointment, but there cannot be

a doubt that in this case, '*routine*,' as in so many other cases, will be likely to mar useful results. The three commissioners have been long accustomed to one certain 'routine' of so-called sanitary operations, namely, *sewers*, *sewer-pipes*, and *sweeping*. We can scarcely expect them to travel out of what they have always practised; and if proof of this be wanted, it is to be found in the fact, that they have specially employed a staff of overseers, selected from Liverpool, who have been always accustomed to remove all nuisance from the streets, &c., by sweeping it up, and carting it away." "Any one who observes a scavenger's operations in sweeping even a paved court or lane, where filth has been thrown, will fully understand that the atmosphere has perhaps more power of producing evil *after the sweeping* than before it." This description, which is more graphic than complimentary, is shown, by their own published Report, to be substantially true of the labours of the Sanitary Commissioners at Scutari and Balaklava. The additional inspection parades, recommended by them and others for the detection of cholera, setting aside the alarm they would have created, must have been made without any consideration, or perhaps knowledge of the punishment they would have been, to men already worn down by duty. At home, in peaceable times, even one additional parade a day is considered a punishment; and I should like to know what any military man would have said to three additional parades a day in the Crimea, as was recommended by one gentleman, in a communication addressed to the Secretary of State for War. And as for Dr. Sutherland's grand scheme, which he takes so much credit to himself for suggesting, of setting men to watch the number of times soldiers obeyed the calls of nature in the open camp, or in the trenches, where about a third of them were daily employed, it is scarcely necessary to characterise it.

No army in this world was ever favoured with a greater number of suggestions from well-intentioned individuals, than the English army in the Crimea was; but, unfortunately, most of them were inapplicable to the wants of the period. For instance, one gentleman recommended vapour baths to be used in the Crimea for personal cleanliness and the destruction of vermin, at a time when there was insufficient fuel to cook the men's food with, and nothing but canvass cover to protect them from the inclement weather of the winter of 1854. Other suggestions that were made were of about the same value, in point of practical utility. And as for the remedies and specifics for cholera that were either recommended, or sent out by parties interested in their result, they were too numerous to mention, and ranged from extract of

arnica to burnt shoe leather! A munificent and kindly-intentioned gift of "Dalby's Carminative" was even included amongst the remedies forwarded for the use of Her Majesty's Army in the Crimea.

At page 35 in his Reply, Dr. Sutherland says I appear to have derived comfort from the comparison drawn between the sanitary condition of Balaklava and certain districts of London and other towns, in his letter to Lord Shaftesbury which was published in the *Times* newspaper. It was certainly a comfort to find such a candid statement, and I have no doubt the impression under which it was written was perfectly sincere, though the doctor seems now to be ashamed of it from the small portion he has quoted in his Reply. In the original, Dr. Sutherland stated for the information of his two friends, for whom he says the letter was written, "It will assist you further to estimate our sanitary condition if I compare it with things at home familiar to you. Balaklava harbour is much sweeter than the Thames, and the town is cleaner than *nine-tenths* of the lower districts of London, Manchester, or Liverpool. Liverpool dock basins smell worse every day than Balaklava did at the worst. When the town itself was held up to the reprobation of the civilized world, from its unburied carcasses and filth, it was not worse than entire villages I could name in our own country; and it was about on a par with the districts where knackers' yards, and private slaughter-houses, and unwholesome trades exist in the Borough, and where cholera was so fatal last year. I think it right to mention this comparison that the truth should be known."

"The same may be said of the sanitary condition of the camp. Putting out of sight the local malaria, the camp is in a much better state than the towns and villages at home, out of which the men have come."

Dr. Sutherland, in his Reply, confines himself to the last part of the first sentence above, which is confessedly the most unfavourable; and he adds that Balaklava, from neglect of sanitary precautions, had descended in six months to the unhealthy position that those at home had only attained after long years of neglect. Oh, Dr. Sutherland, fie! have you no shame in making such a statement?

Scutari.

At page 10, Dr. Sutherland says I ought to have stated that the cleansing and whitewashing of the barrack rooms at Scutari were written about at the request of Lord Raglan, and that there

appears to have been no sanitary advice given by any one regarding the Kulali palace, or stable hospitals.

It is necessary I should state that nearly one of the first things I did when I joined head-quarters at Varna, in June 1854, was to recommend to Lord Raglan that the upper part of the west front, and one half of the south front of the main barrack at Scutari, should be given over to the medical department, in order that the rooms might be purified and fitted up for the reception of sick. I also requested that the hospital at Abydos might be completed, and that application should be made to the Turkish Government for the remainder of the general hospital at Scutari, and for the upper wards of the military hospital at Kulali.

The barrack and riding school hospitals at Kulali were fitted up under the immediate superintendence of 1st Class Staff-Surgeon, Dr. Tice; and those of the stables and Hyder Pasha palace at Scutari, under the supervision, I believe, of the principal medical officer there.

I had no personal knowledge of these buildings, and my duties in the Crimea were so constant and laborious, that, after October 1854, I had no time to visit them; but this was the less called for, as early in 1855 they came under the supervision of an old and experienced officer of my own rank, who, I have no doubt, will be able to give explanations of many things that are stated in Dr. Sutherland's Report. After October 1854, my control over the economy of the hospitals at Scutari was merely nominal, as the principal medical officer reported direct to London; but, in my capacity of principal medical officer of the army, I was to a certain extent held responsible for their condition, and of this I have no right or wish to complain.

The conversation with Lord Raglan, quoted in my letter to Dr. Menzies of the 13th August, 1854, and referred to by Dr. Sutherland, was evidently given to add weight to my instructions; but it can hardly be adduced as a proof, nor would it be so taken by any one acquainted with the forms of official military correspondence, that the idea originated with Lord Raglan, which it certainly did not.

The subject of hospital accommodation had been matter of conversation between us on several former occasions, and when the barrack rooms at Scutari were finally given over to the medical department, he directed me to urge on Dr. Menzies the necessity of taking immediate steps to get them purified. He also instructed me to desire him to apply direct to the principal dragoman of the embassy at Constantinople, for anything he might require from the Turkish Government, in place of sending

his applications through other channels; and in the same communication I pointed out to him the portion of the barracks which I thought he ought to avoid, on account of its faulty drainage and want of repair.

At page 11, Dr. Sutherland quotes from a letter of mine to the Director-General of the Army Medical Department, under date of the 28th October, 1854, and makes me say that the hospitals at Scutari "were in a very satisfactory condition." In the copy of my letter of that date I cannot find this expression; but I see I pointed out to him the discomfort that was occasioned, on the first opening of the barrack hospital, by the non-arrival of boards and tressels, which I had ordered on the 3rd of September, 1854, to be sent down from Varna, and mentioned that 500 sets had then been received, which had enabled us to put the whole hospital establishment at Scutari "in a very creditable state," and that the sick and wounded were all doing as well as could possibly be expected. I further stated, that by the strenuous exertions and unceasing labours of 1st Class Staff-Surgeon Dr. Menzies, and the medical officers under him, our difficulties had, in a great measure, been surmounted, and in a short time, I flattered myself, we should have an hospital establishment that would bear a comparison with any other of the same magnitude, formed under similar disadvantages.

Such was my opinion at the time, and such it still remains, notwithstanding the popular indignation, which, Dr. Sutherland says, "was at that very time roused throughout all England concerning them;" and I think I was borne out in my statement. Each patient had a comfortable bed and bedding all perfectly new, the rooms and galleries were clean and not overcrowded, as there were 600 spare beds in the hospitals at Scutari at the time my letter was written. The privies and drains, of which so much was subsequently said, were not then in any way offensive, and distant as the privies were from each other, and separated as they were by a room and passage from the corridors, and placed as they were in a distinct building at the inner angles of the barrack which measured 840 feet by 630 feet, it is difficult to conceive how, with an outfall of the drainage of 148 feet in less than 200 yards, they could under almost any circumstances have become so offensive and pestilential as they are represented to have been by the Sanitary Commissioner, for it must be borne in mind that the lower floor of the barrack was not occupied by sick. I am censured by Dr. Sutherland, and accused of ignorance and incompetency, for having allowed sick and wounded men to be placed in wards at the barrack hospital, Scutari, which

measured on an average 49¼ feet in length, 31⅔ feet in breadth, and 15½ feet in height, each ventilated by three large windows opening outwards, and a door and two or more windows opening inwards into a corridor 18 feet wide, running the whole length of the building, which had numerous windows, and communicated with the inner square by means of large well staircases at certain intervals. With favourable weather, a class of patients by no means severe, and the regulated allowance of five feet of surface wall for each, few medical men, I fancy, will think there was anything so very faulty in this arrangement as a temporary expedient, nor will they perhaps consider that the necessity of resorting, in the first instance, to the more elaborate and scientific alterations of the building which were subsequently carried out by the Sanitary Commissioners, was so urgent as has been represented; but even had it been so at the period of its first occupation, there was neither time nor means to effect them.

In the course of the winter of 1854-5, the hospitals at Scutari became more crowded than was desirable, from the great influx of sick sent down from the Crimea; but that was matter of necessity, not choice, and the privies and their approaches may occasionally have been rendered dirty and offensive by the negligence of the hospital servants, but this could only have affected the corridors in their immediate neighbourhood, and not the whole of the 28 wards opening out of them, as one would be led to infer from reading Dr. Sutherland's statement, which leaves an impression as if the privies opened directly into the wards where the sick were. Whereas, the privies were placed in the barrack hospital in detached buildings, in the inner angles of the square, and in the general hospital, in detached buildings at the outer angles of the square; and I can hardly imagine the principal medical officers at Scutari would have allowed such a nuisance, as is described by Dr. Sutherland, to exist in the hospitals there.

Unfortunately, much sickness, and lamentable mortality, occurred in the British army, during the winter of 1854-5; but when the Sanitary Commissioners arrived at Scutari, in March 1855, sickness was diminishing rapidly, and the cases of diseases which presented themselves, were of a much milder character than they had been during the winter. The Sanitary Commissioners, in their Report, gave a table showing the decrease of sickness and mortality in the Scutari hospitals after their arrival, which they ascribed to their own sanitary labours in and about the buildings; but as this did not strike me to be a correct deduction, I stated in my observations that the diminished number of sick, and milder nature of the cases of disease sent down to the hospitals at Scutari

from the Crimea, after their arrival, might have influenced the results more than their flaps and traps in the privy drains; and as an example, I mentioned the number that had been embarked, and the number that had died on the passage during two periods, the one immediately preceding, and the other immediately following the arrival of the Commissioners. I put this in as plain a manner as I could, and I thought it would have been intelligible to every one, but Dr. Sutherland has so mystified it by his subtle reasoning, that I can scarcely recognise my own statement; and the shortest way I suppose will be to admit, that, because the Sanitary Commissioners trapped the privy drains in the barrack hospital at Scutari, sickness and mortality diminished in the Crimea.

To prove that deaths on board the hospital ships had no relation to the deaths in hospital at Scutari, Dr. Sutherland instances the month of December 1854, when a number of the sick embarked at Balaklava were labouring under cholera and its sequelæ; and the month of February 1855, when the hospitals at Scutari were filled with fever cases that had been accumulating during the previous month. In the one case it was reasonable to expect death to occur more speedily, and in the other, in addition to the chances of serious fever cases sent down there for treatment, the worst cases of those embarked for Smyrna and Abydos were removed from the ships as they passed Scutari. This alters the doctor's proposition very much, and in his comparison between the Crimea and Scutari he leaves out of sight the fact that every slight as well as every serious case of disease admitted into hospital is included in the former, whereas during the winter of 1854-5 only serious cases of disease were sent down to the latter.

In my abstract of admissions and deaths in the Crimea, from December 1854, to August 1855, I omitted the strength of the army, to save figures, which I admit I ought not to have done; and the doctor is quite witty on the subject: but, respectable as the increase of the British force in the Crimea was, it bore no relation to the comparative numbers of 25,000 and 2,500,000, which have been adduced as an example by Dr. Sutherland.

At pages 14 and 27 of his Reply, Dr. Sutherland gives two of what he calls corrected statistical tables, both of which are erroneous in almost every particular, but taken even according to his own showing, they tell against himself, and prove that sickness and mortality had begun to decrease in the army before the arrival of the Sanitary Commissioners at Scutari, and continued to do so until the month of May 1855, when they began to increase again; but it would be as unjust to charge this increase to the Commissioners, as it was unfair for them to claim the merit of the

decrease which had commenced before their arrival in the country, for both these changes were owing to causes over which their trifling sewage operations at Scutari had not the remotest influence. I do not know from what source Dr. Sutherland obtained information for the two Returns which he has given in his Reply, but the annexed tables, copied from documents in my possession, will show how erroneous they are, and what little reliance can be placed on conclusions drawn from such false premises.

No. 1.—*Copy of Return, inserted at page 14 of* Dr. Sutherland's Reply.

Months.	Sick admitted at Kulalee.	Died on Passage.	Deaths per 1000 on Sick Admitted.	Hospitals at Scutari and Kulali.		
				Mean Sick Population.	Deaths per 1000 of cases treated.	Period of Sanitary Improvement.
1854.						
September	3,987	311	78	. .	. .	
October	1,721	76	44	2,816	125	
November	1,902	163	84	3,119	118	
December	3,339	314	94	2,457	144	
1855.						
*January	2,144	172	80	4,449	316	
*February	2,178	41	19	4,178	427	
*Three weeks ending March 17th . . .	1,667	5	4·6	3,779	315	Three weeks ending 17th March, 1855.
April 7th	860	4	4·6	3,306	144	April 7th.
„ 28th	793	8	10	2,903	107	„ 28th.
May 19th	471	—	—	2,618	52	May 19th.
June 9th	615	1	1·6	1,504	48	June 9th.
„ 30th	690	8	9·0	1,442	22	„ 30th.

No. 2.—*Return compiled from original documents furnished to the* Inspector-General *of* Hospitals in the Crimea.

Months.	Number of Sick embarked from the Crimea.	Died on Passage.	Deaths per 1000 of Sick embarked.	Return of Sick treated in the Hospitals at Scutari and Kulali.						Remarks.
				Remained in Hospital at the beginning of the Month.	Admitted.	Total treated.	Discharged.	Died.	Deaths per 1000 of cases treated.	
1854.										
September .	4030	357	88	..	..	..	..	..	..	Wounded from the Alma, and cases of cholera.
October . .	1714	77	43	2277	1461	3678	1231	211	57·36	
November .	1986	113	56	2256	2611	4867	1716	269	49·25	
December .	4393	325	74	3867	3161	6968	1911	504	72·32	Cholera prevailed, and very fatal this month.
1855.										
January .	3440	230	66	4548	3900	8448	2046	1207	144·17	
February .	1884	23	12	5195	2688	7883	2204	1328	168·46	
March . .	960	5	5	4351	2833	7184	2937	855	77·25	
April . .	1162	5	4	3792	1767	5559	2500	201	36·15	
May . . .	824	2	2a	2858	1978	4736	2333	95	20·05	
June . . .	1167	12	10	2308	1847	4155	2187	46	11·07	

a. Included as casualties in my observations, but on more minute examination of the Returns, I find they were sick Croat labourers, and ought to have been omitted, which would have made the number of deaths in the second period 17, instead of 19, as stated.

Return No. 2, shows so marked a decrease in the number and mortality of cases sent down from the Crimea to the hospitals at Scutari, for treatment, during the month of February 1855, that it is almost superfluous to state, that a favourable change in the health of the army had commenced before the arrival of the Sanitary Commissioners at Scutari; but if anything further were required to establish the fact, I might be allowed to quote the following extract from a communication of mine to the Director-General of the Army Medical Department, which was written on the 23rd February, and had no reference to any inquiry of this kind, so that it may be fairly taken as an unbiassed expression of my opinion on the subject:

"You will be pleased to learn that an improvement has taken place in the health of the troops of late, though I am sorry to say our sick list still continues very heavy."

"The type of fever which prevailed in the general hospital at Balaklava, and in the 93rd and some other regiments, has changed from the typhoid to the remittent, and even intermittent character. For a week or ten days preceding the 19th, the weather was mild and genial, and the men began to regain their health and spirits, but on the 19th, the wind changed to the north, and we had a violent snow storm during the 20th, but as yet I cannot observe that it has done much injury to the sick."

At the end of the month, in my weekly report to the Commander-in-Chief, I find the following observation on the same subject:—"It was wonderful to see the cheering effect the few fine days had on the health and spirits of the men; and as the winter may now be considered nearly at an end, I am full of hope and confidence."*

In the 2nd part of Dr. Sutherland's Return, it will be seen that the deaths per 1000 of cases treated, is calculated from the sick in hospital at certain fixed periods, and not from the whole number treated, which makes the mortality, that is lamentable enough in reality, appear excessive.

At page 27 of his Reply, Dr. Sutherland gives the following Table of admissions and deaths in the whole army, from December 1854, to May 1856:—

Months.	Admissions to Strength per 1000 per Annum.	Deaths to Strength per 1000 per Annum.	Months.	Admissions to Strength per 1000 per Annum.	Deaths to Strength per 1000 per Annum.
1854			1855		
December .	3888	721	September .	2004	121
1855			October . .	1380	49
January . .	4176	1173	November .	1176	52
February . .	2760	979	December .	1332	32
March . . .	2316	561	1856		
April . . .	1716	223	January . .	1116	21
May . . .	1944	202	February . .	924	9
June . . .	3396	318	March . . .	972	10
July . . .	2832	152	April . . .	840	8
August . .	2760	181	May . . .	720	7

From what data Dr. Sutherland has calculated the above table, I do not know; but it is at variance with the following per centages, which are taken from authentic documents.

In the following statement, the admissions are confined to those of a primary kind, as the transfers to general hospitals were only multiples of the same; but the

* In my sanitary observations on the Adjutant-General's Monthly Return for February 1855, the subject is entered on at greater length.

deaths include the whole mortality of the army, whether in general or regimental hospitals, or on board ship at sea.

	Per Centage of Admissions to Strength in the Crimea.	Per Centage of Deaths to Strength in all Places.	
April, 1854	3·9	0·07	
May „	10·2	0·09	
June „	9·3	0·06	
July „	17·5	1·33	Cholera in Bulgaria.
August „	28·2	2·84	
September „	22·3	3·10	Battle of the Alma, and Cholera.
October „	23·6	2·49	Battle of Balaklava.
November „	27·8	4·16	Battle of Inkermann, and Cholera.
December „	32·4	6·01	Cholera prevalent.
January, 1855	34·8	9·78	Fever.
February „	23·0	8·16	Ditto.
March „	19·3	4·68	
April „	14·3	1·86	
May „	16·2	1·69	
June „	28·3	2·65	Assault of Redan, and Cholera.
July „	23·6	1·27	Cholera.
August „	23·0	1·51	Cholera.
September „	16·7	1·01	Assault of Redan.
October „	11·5	0·41	Relieved from Trench and Night Duty.
November „	9·8	0·48	
December „	11·1	0·27	
January, 1856	9·3	0·18	
February „	7·7	0·08	
March „	8·1	0.09	
April „	7.0	0·07	
May „	6·0	0·06	
June „	3·6	0·02	

The above Table exhibits a gradual increase of sickness and mortality from April 1854 to January 1855, when, from the improved condition of the men, they began to decrease; and after the capture of Sebastapol, in September 1855, which relieved the men from trench and night duty, a marked improvement in the health of the army took place, which was never interrupted so long as it remained in the Crimea.

The doctor is indignant at the sewage operations of the Sanitary Commissioners being undervalued; and, at page 11, he gives a table of the works performed, in which he allows it to be understood that they were all carried out before the 30th of June, 1855, the date to which my observations allude. But if the reports of others be taken, it will be found that some of them were not carried out for eight or nine months afterwards, and others not at all.

The Sanitary Commissioners brought out with them skilled engineers and workmen, and were invested with almost unlimited

authority to hire labourers to carry out their views, and yet, according to their own showing, it is astonishing how very little they accomplished, and how many months elapsed before their more important works were completed—for to talk of so many hand carts or baskets full of rubbish removed from one place to another, is ludicrous to any one who knows what that really means amongst Eastern labourers. I say, with these advantages at their command, and knowing how little they really accomplished, and with what difficulty they accomplished that little, one might have thought they would have had more consideration for their brethren of the military profession who were less fortunately situated, and whose powers were limited to recommendations, which had to be regulated by the exigencies of the service, and due respect and consideration for those in command.

The system of what is called putting on record recommendations and demands that you know those in authority have no means of carrying out, only creates embarrassment, without serving any useful purpose, and ought to be discountenanced and despised by all upright men.

Dr. Sutherland, at page 1 of his Reply, says that I seem to think gaining of credit is the main aim of public service. I have certainly lived long enough to be very sceptical about the philanthropy of mankind. Most men have some object in view—something which they are anxious to obtain—whether it be mere credit or more solid advantages; and, from my intercourse with Dr. Sutherland, I should say he was no exception to the general rule.

London, February 1858.

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14, Charing Cross.

MÉMOIRE

SUR LA

TRÉPANATION CÉPHALIQUE

MÉMOIRE

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TRÉPANATION

CÉPHALIQUE

PRATIQUÉE PAR LES MÉDECINS INDIGÈNES DE L'AOURESS

(Tribus des Ouled-Zian et des Beni-Ferrah, province de Constantine (Algérie))

PAR

M. LE DOCTEUR AMÉDÉE PARIS

Ancien Médecin militaire et en chef de l'Hôpital militaire de Biskra (Algérie);
Membre de la Société de Climatologie algérienne;
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Médaille du Choléra (1854);
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PARIS
ADRIEN DELAHAYE, LIBRAIRE-ÉDITEUR
PLACE DE L'ÉCOLE-DE-MÉDECINE

1865

Angoulême. — Nouvelle Imprimerie QUÉLIN frères, rue des Moulins, 2, et rue du Minage.

A MONSIEUR

LE BARON H. LARREY

Chirurgien ordinaire de S. M. l'Empereur ;
Médecin-Inspecteur du Service de santé de l'armée ; Membre de l'Académie impériale de Médecine ;
Commandeur de l'Ordre impérial de la Légion-d'Honneur.

Témoignage de sincère reconnaissance.

Dr Amédée PARIS.

MÉMOIRE

SUR LA

TRÉPANATION CÉPHALIQUE

PRATIQUÉE PAR LES MÉDECINS INDIGÈNES DE L'AOURESS

(Tribus des Ouled-Zian et des Beni-Ferrah, province de Constantine (Algérie)

INTRODUCTION

Il nous a paru intéressant d'étudier et de montrer de quelle manière la tradition a légué aux habitants ignorants et grossiers des tribus de l'Aouress (Ouled-Zian et Beni-Ferrah) la trépanation céphalique, cette opération délicate, qui exige de la part du chirurgien des connaissances étendues en anatomie, en pathologie et en médecine opératoire.

L'histoire du pays nous dit que les Rhazès, les Avicenne, les Abulcasis, arabes de naissance et qui restèrent attachés au sol, traduisirent et commentèrent les

œuvres d'Hippocrate; elle nous dit également, et un monument en fait foi, que les Romains laissèrent à Lambessa, près Batna, province de Constantine, dans le voisinage de l'Aouress, un temple élevé à Esculape. Les Romains cultivaient la pratique médicale des peuples grecs; comme eux, ils connaissaient la trépanation.

C'est, nous le croyons, de cette double source qu'émanent les notions de la trépanation, que les tribus précitées se sont transmises et que nous avons recueillies pendant notre séjour à Biskra (province de Constantine), que nous habitâmes, pendant les années 1859, 1860 et 1861, en qualité de médecin en chef de l'hôpital militaire.

Nous eûmes, durant ce laps de temps, l'occasion de voir les instruments dont les médecins indigènes de l'Aouress se servent pour pratiquer la trépanation céphalique. Nous aurions été heureux de garder ces instruments en notre possession; mais, ceux qui nous étaient montrés passaient pour être sacrés; ils étaient, de plus, la propriété exclusive d'une famille de médecins, qui se les transmettaient comme un héritage, en même temps qu'ils enseignaient aux leurs les moyens de s'en servir. Nous les avons dessinés d'après nature et nous ajoutons au présent mémoire leur représentation exacte.

Par notre position spéciale, par nos relations amicales et de service avec MM. les officiers du bureau arabe de Biskra, nous fûmes plusieurs fois appelé à constater les résultats de la trépanation pratiquée sur des sujets d'âge différent.

Les faits que nous avons observés nous paraissent offrir à l'histoire de la chirurgie des documents précieux.

Nos confrères profiteront en même temps de cette importante découverte qui assure à leur pronostic des espérances que la trépanation céphalique laissait jusqu'à ce jour rares et souvent illusoires.

---

§. I. **Définition.**

La trépanation céphalique est pour les médecins indigènes de l'Aouress une opération qui a pour but d'enlever au crâne une plaque osseuse carrée.

Cette opération est le privilège de certains médecins; elle les distingue seule de leurs confrères du voisinage et, nous pouvons le dire, de tous ceux de l'Algérie.

§. II. **Indications de la Trépanation.**

La trépanation est pratiquée :

1° Dans les cas de fractures simples du crâne ;
2° Dans les cas de fractures avec esquilles ;
3° Dans ceux où l'os est carié ou nécrosé ;
4° Pour combattre les grandes douleurs de tête, telles que les douleurs ostéocopes.

L'âge n'est pas pris en sérieuse considération par les

médecins. Néanmoins, nous n'avons pas vu d'opérés qui eussent moins de dix ans et d'autres plus de soixante.

§ III. Lieux d'élection.

Les médecins n'ont aucune connaissance anatomique; ils agissent sur les parties malades, peu inquiets s'ils doivent atteindre des vaisseaux, des membranes importants. Ils se contentent de dire au blessé, au moment de l'opération : « Tu guériras, s'il plait à Dieu ! » et à la famille, si l'opéré succombe : « C'était écrit. »

§ IV. Instrumentation.

L'arsenal de l'opérateur se compose :

1° d'un rasoir ;
2° d'une serpette ;
3° d'une scie simple ;
4° d'une scie double ;
5° d'un élévatoire droit ;
6° d'un élévatoire courbe.

§ V. Description des instruments.

1° Le *rasoir* est ordinairement un vieux rasoir européen, dont l'usage n'est pas exclusivement réservé

à la pratique de la trépanation céphalique : il sert également à raser la tête des hommes sains et aux scarifications, dont les médecins indigènes sont si prodigues.

2° La *serpette* est formée d'une lame de fer aciéré recourbée et tranchante à son extrémité supérieure et dont l'extrémité inférieure est fixée à un manche de tamarin. Elle est souvent remplacée par le *rasoir*.

3° La *scie simple* (fig. 2) se compose de deux parties distinctes, mais réunies : la scie proprement dite et le manche. Celui-ci est un morceau de branche de tamarin, qui mesure huit centimètres de longueur et deux centimètres de diamètre ; il est percé, dans sa longueur, d'une ouverture circulaire pratiquée à l'aide d'une tige de fer rougie au feu : cette ouverture reçoit la tige de la scie.

La *scie* est formée d'une lame de fer aciéré aplatie supérieurement et se terminant en pointe inférieurement. Cette pointe ou tige passe par l'ouverture du manche et se recourbe à angle droit à l'extrémité inférieure de celui-ci : elle mesure quatorze centimètres de longueur. En haut, la partie aplatie est large de deux centimètres, haute d'un centimètre : elle présente deux faces planes, un côté arrondi et un autre taillé verticalement et découpé par des dents au nombre de quatre à cinq ; chaque dent a deux millimètres de profondeur et un millimètre d'épaisseur.

4° La *scie double* (fig. 1) est également formée d'une tige de fer aciéré, aplatie supérieurement et terminée en bas par une pointe, qui traverse un manche de tamarin, de mêmes dimensions que celles du manche de la scie simple. La partie supérieure de la tige diffère seule de la précédente. Elle forme un T à branches supérieures un peu recourbées et amincies qui présentent chaque, comme celle de l'extrémité supérieure de la scie simple, deux faces aplaties, une face verticalement taillée et découpée par cinq à six dents plus petites que celles de la scie simple.

5° *L'élévatoire droit* (fig. 3) est formé d'une tige de fer de six centimètres de longueur, dont l'extrémité supérieure, amincie et taillée en biseau, est aplatie dans une étendue d'un centimètre et demi en largeur; elle est fixée par son extrémité inférieure à un manche de tamarin.

6° *L'élévatoire courbe* (fig. 4) est une tige quadrilatérale de fer, aplatie supérieurement et recourbée en forme de petite houe, dont l'extrémité est amincie et taillée en biseau, de manière à permettre l'introduction facile de cet instrument sous le carré osseux à détacher.

La tige est de la même longueur que celle des instruments qui précèdent et, comme elle, se fixe en bas à un manche de tamarin.

§ VI. **Objets du Pansement.**

Le principal objet du pansement de la plaie céphalique, qui résulte de la section osseuse, est une *plaque de cuivre* (fig. 5) circulaire, mesurant cinq centimètres de diamètre. Elle présente deux faces : une supérieure ou externe ; une inférieure ou crânienne. Au centre de cette dernière face, existe une cavité hémisphérique, dont le diamètre est de deux centimètres. Cette cavité est formée par la plaque repoussée de la face interne à la face externe, sur laquelle elle fait saillie.

Dans l'espace qui sépare la cavité du rebord de la plaque, se trouvent percés vingt à trente trous irréguliers, qui traversent la plaque et par lesquels les produits de la suppuration peuvent s'échapper. Ces trous servent en même temps au passage de cordons de laine, destinés à fixer la plaque sur les objets du pansement et sur le crâne. Ces cordons sont au nombre de deux ; ils affectent la disposition suivante : l'un des cordons est passé par un trou de la face externe à la face interne de la partie plane de la plaque et de celle-ci, par un trou voisin de la cavité hémisphérique, à la face externe d'où il monte sur la saillie. Là, le premier cordon rencontre un autre cordon, qui a été semblablement conduit, mais en sens opposé, de manière à croiser le premier sur la saillie. Il s'enroule sur ce cordon et se rend à l'extrémité du diamètre, qu'il trace ainsi par son application sur la

plaque, pour passer par un autre trou. Chaque cordon est libre à son entrée dans le premier trou qu'il traverse; mais il se termine par un fort nœud simple au moment où il arrive en dernier lieu à la face interne de la plaque. Au niveau des bords externes du dernier trou traversé par le cordon, celui-ci est soulevé et tendu par un cordon qui s'enroule autour de lui et qui est ensuite laissé flottant. Chaque cordon a une longueur suffisante pour que la plaque puisse être appliquée sur les pièces du pansement et maintenue solidement à la tête.

Les autres pièces du pansement se composent :

1° d'une petite compresse de coton;
2° d'un morceau de burnous de laine.

La compresse de coton est recouverte, au moment du pansement, de goudron liquide.

§ VII. **Opération.**

MANUEL OPÉRATOIRE.

Le malade est assis par terre, sur un rocher, sur un banc de pierres ou de boue séchée au soleil.

PREMIER TEMPS. — *Dénudation de l'Os.*

La partie de la tête qui doit être trépanée est d'abord rasée. L'opérateur taille ensuite avec la *serpette* ou le *rasoir* un carré de peau, qui circonscrit la plaie ou la partie douloureuse.

Chaque incision pénètre jusqu'à l'os. La rétraction de la peau permet de disséquer celle-ci, en passant au dessous d'elle la serpette qui détache le lambeau de ses adhérences. Avec la même serpette, l'opérateur rugine l'os sur les lignes tracées par les incisions et le prépare à l'action des *scies à main*.

DEUXIÈME TEMPS. — *Section de l'Os.*

Sur les lignes de circonscription de la plaie ou de la douleur, l'opérateur applique d'une main ferme la *scie simple*, qu'il promène d'un angle à l'angle opposé et ainsi de suite jusqu'à ce que les lignes du carré soient toutes parcourues. Il arrive de la sorte et avec une lenteur effrayante, mais que le patient supporte avec résignation, à user l'os et à frayer une voie pour la *scie double* ou la *scie à dents fines*.

Avec le changement de coloration de la sciure, il change de scie et fait usage de la *scie double*. De même

que la première, il promène cette deuxième scie dans la voie tracée sur les lignes de circonscription et parvient à user la table interne.

TROISIÈME TEMPS. — *Extraction du Carré osseux.*

Lorsqu'il n'entend plus le bruit rude et sec de la scie sur l'os; qu'il sent la scie s'enfonçant dans la cavité crânienne, l'opérateur essaie, à l'aide de *l'élévatoire droit*, de détacher le carré osseux : s'il trouve trop de résistance, il continue de scier jusqu'à ce qu'après maintes tentatives, il sente le carré osseux libre. Il introduit alors, au-dessous de la partie la plus libre, l'extrémité recourbée de *l'élévatoire courbe* et détache brusquement le carré osseux des adhérences qui peuvent encore le retenir au crâne. Dans ce mouvement souvent mal exécuté, il arrive quelquefois que le carré osseux entraine avec lui une partie de la table externe ou de la table interne voisine : tel est le cas d'un sujet dont l'os trépané a été soumis à notre examen et que représente la figure 6.

QUATRIÈME TEMPS. — *Pansement.*

L'opérateur retire avec une pince à épiler les fragments osseux enfoncés dans les parties sous-jacentes, essuie le sang ou le pus avec un chiffon de coton; puis il applique les divers objets du pansement. Il enduit d'une

épaisse couche de goudron la petite compresse de coton et l'introduit dans la plaie, en pressant sur elle avec le doigt indicateur ou le pouce. Il recouvre cette compresse et les bords de la plaie d'un morceau de burnous de laine et sur le tout il met la plaque de cuivre, qu'il fixe à l'aide des cordons.

L'opération étant terminée, on rabat sur la tête du malade le capuchon de son burnous.

Au bout de trois à quatre jours la suppuration s'établit; elle s'échappe sur les bords de la plaie, passe sous la plaque de cuivre ou filtre par les trous de cette plaque. L'opérateur, mieux les parents du malade (car le premier est souvent absent, en pratique sur les marchés voisins où il rase, ventouse) délient les cordons de la plaque, retirent les compresses de laine et de coton et renouvellent le pansement en observant strictement les indications du premier pansement.

Ce pansement est continué pendant deux à trois mois; alors, la plaie osseuse est comblée par des bourgeons charnus.

Les bourgeons charnus arrivés au niveau du cuir chevelu sont quelquefois laissés sans pansement; ils se séchent au contact de l'air chaud, emprisonné de la calotte de carton. Une croûte épaisse se forme ainsi et l'opéré n'a plus de souci de son mal. D'autres fois, les bourgeons sont recouverts de goudron liquide saupoudré d'alun destiné à les arrêter par son astringence et à faciliter la formation de la croûte que l'opéré, l'opérateur et les parents respectent.

A une époque qui varie entre six mois et un an, la guérison est obtenue. Chez quelques personnes syphilitiques ou scrofuleuses, la guérison se fait longtemps attendre ou n'arrive jamais, parce que les malades ne sont soumis à aucun traitement spécifique.

§ VIII. **Observations.**

Nous avons vu cinq malades opérés par la trépanation et qui se promenaient sans être guéris, et cependant sans inquiétude. Chez deux de ces opérés, nous avons trouvé le carré osseux réparé par un tissu résistant, blanchâtre, déprimé à son centre ; les autres présentaient des bourgeons charnus qui donnaient au doigt la sensation des mouvements du cerveau. Tous avaient été trépanés dans la région pariétale : quatre à droite, un à gauche ; trois en avant et sur la partie moyenne de l'os, un sur le milieu de l'os, un en arrière et sur la partie moyenne.

Le 10 avril 1860, M. le capitaine Rose, chef du bureau arabe de Biskra, nous envoya un enfant, âgé d'environ dix ans, des Beni-Ferrah. Cet enfant était tombé, la tête la première, de la terrasse de sa maison sur un tas de pierres.

Un opérateur avait trépané cet enfant quarante jours avant notre examen pour une fracture prétendue. Il avait enlevé un carré osseux au pariétal droit, au-dessus de l'angle antéro-inférieur de cet os et avait ainsi évité

la déchirure de la branche antérieure correspondante de l'artère sphéno-épineuse, partant l'hémorrhagie sérieuse qui en résulte.

Nous reconnûmes la brèche osseuse carrée, régulière et en grande partie comblée par des bourgeons charnus, doués de mouvements isochrones à ceux du cerveau.

A la suite de la contestation sur le prix réclamé par l'opérateur pour les soins qu'il avait donnés à l'enfant, la famille de l'opéré venait soumettre la cause à la juridiction du bureau arabe de Biskra, fondant son opposition sur les motifs suivants : 1° l'opération qui avait été pratiquée n'avait pas de raison d'être ; 2° cette opération avait été mal faite.

La trépanation céphalique est généralement considérée par les indigènes de l'Aouress comme une opération qui est sans résultats dangereux. C'est pourquoi elle a fait naître, chez quelques personnes, la pensée de se faire trépaner pour assouvir la soif de l'or, qui dévore les populations arabes. Voici ce qui nous a été raconté à ce sujet et qui s'est passé dans l'année 1859 :

Deux individus des Beni-Ferrah avaient eu une que-

relle, dans laquelle l'un deux avait porté des coups de bâton sur le corps de l'autre, sans atteindre la tête.

Quelques jours après, le battu se faisait trépaner pour une prétendue fracture du crâne. Il ne manqua pas, durant le traitement, de profiter de son état pour intenter un procès à son adversaire qui justifia de la ruse et de l'audace du premier et le fit punir, ainsi que l'opérateur qui avait facilité le procès par son intervention criminelle.

EXPLICATION DE LA PLANCHE

(Les figures donnent la grandeur naturelle des instruments et autres objets).

Fig. I. Scie double.

Fig. II. Scie simple.

Fig. III. Élévatoire droit, vu de face.

Fig. IV. Élévatoire courbe, vu de côté.

Fig. IV *(bis)*. Extrémité supérieure, en forme de houe, de l'élévatoire courbe.

Fig. V. Plaque de cuivre percée de trous.

A. Face externe de la saillie hémisphérique.

B. L'un des trous.

C. D. Cordons de laine à leur entrée dans les trous de la plaque.

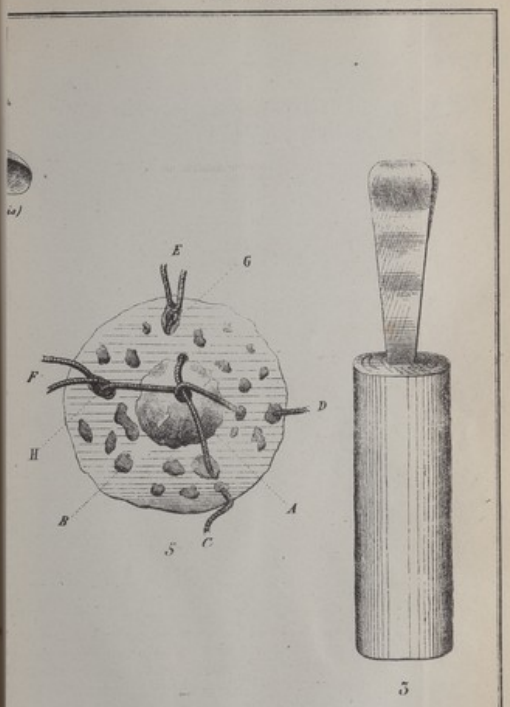
H. G. Cordons de laine à leur entrée dans les trous sur le bord interne desquels ils sont noués.

E. F. Cordons de traction ajoutés aux précédents cordons.

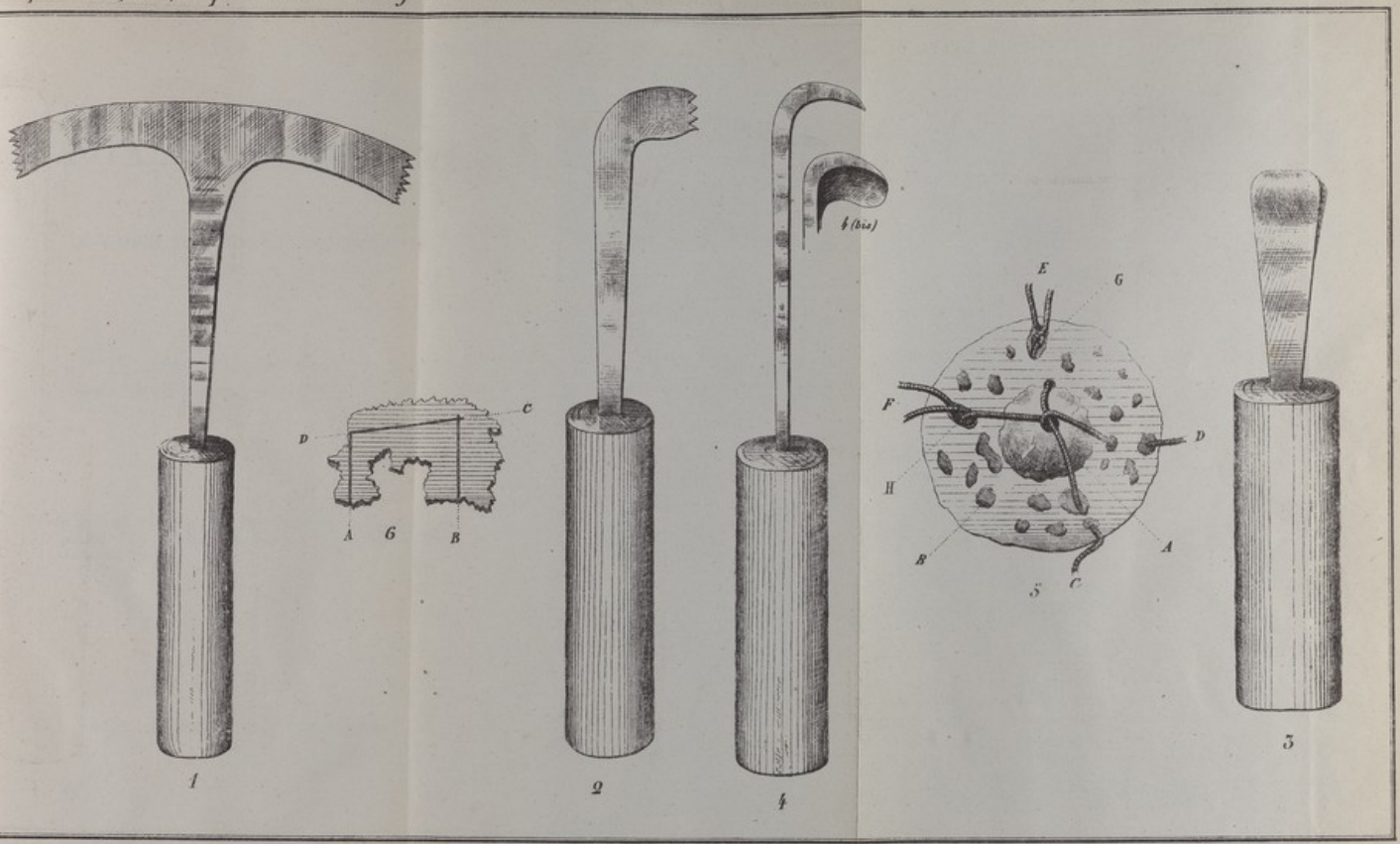
Fig. VI. Plaque osseuse enlevée à un pariétal droit.

A. B. C. D. Lignes droites qui circonscrivent un orifice anfractueux, suite d'une carie, par lequel l'opérateur a introduit un élévatoire courbe. Les efforts développés pour arriver à l'extraction du carré osseux ont détaché la plaque représentée par le dessin.

Dr. Amédée PARIS.



La Trepanation pratiquée par les Médecins indigènes de l'Aouress. *Dr. Amédée Paris.*



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Lith. Maisonnat Amiens

ACCOUNT OF A RECENT REMARKABLE

CASE

OF

SCROTAL ELEPHANTIASIS,

IN WHICH THE TUMOUR WAS REMOVED.

BY

JOHN WIBLIN, F.R.C.S.,

MEDICAL SUPERINTENDENT OF QUARANTINE, SOUTHAMPTON.

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1863.

ACCOUNT OF A RECENT REMARKABLE CASE

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JOHN WIBLIN, F.R.C.S.,

MEDICAL SUPERINTENDENT OF QUARANTINE, SOUTHAMPTON.

Received Oct. 13th.—Read Nov. 11th, 1862.

The subject of the following history, George F—, was a native of Southampton. He was forty years of age, sallow of complexion, but otherwise seemingly of healthy aspect; married, but without family. From the age of sixteen he had worked as an ordinary labourer on the town quays and in the docks, except during the two years 1835 and 1836, when he was employed in the coasting trade from Southampton to several of the ports of England, Ireland, and Scotland. His habits had always been moderately temperate, and (according to his own belief) his health excellent, having suffered from but one severe illness, when a child.

In the year 1844, whilst in the act of grinding malt, he ruptured himself on both sides. For the relief of this ailment, and under the direction of the parochial medical officer, he wore a suitable truss two or three years. The rupture on the left side becoming rapidly larger, he obtained a new truss, wore it for a year or more, but finding that it afforded little relief, he abandoned its use altogether.

In the year 1848 he contracted syphilis. For the cure of this disorder he applied to a druggist, who (if his own statement is to be credited) gave him corrosive sublimate in tolerably large doses, at intervals, over a period of six months, when he considered himself perfectly cured.

About three months after he had become the subject of syphilis, the foreskin and integuments of the penis began to enlarge, and he constantly experienced a dull, aching pain at the extremity of that organ. From this period the scrotum also gradually increased in size, becoming hard, brawny, heavier, and more pendulous.

Six months after he had contracted syphilis an eruption appeared on the arms, consisting (according to his own description) of large red patches covered with numerous "boils," and ending in suppurating sores, which, on healing, left a distinct scab. This eruption, at the time I first saw him, had continued more or less for a period of six years, and it was present on the scalp, nape of the neck, abdomen, back, pubes, and all over the anterior surface of the hypertrophied scrotum, and possessed the chief characters of *vitiligo*—consisting mainly of large white patches, surrounded by a bronzed margin.

When the case came first under observation, the abnormal growth of the prepuce and scrotum had attained the following dimensions:

Preputial growth.—Length, 16 inches; circumference, 13 inches.

Scrotal growth.—Vertical circumference, from the symphysis pubis, following the raphé of the scrotum, to within two inches of the anus, 3 feet 6 inches; lateral circumference, 3 feet 14 inches.

The scrotum and prepuce had increased very rapidly in size within the two last as compared with previous years. The enlargement had, moreover, become extremely burthensome, and, in some spots, painful; while, in others, particularly where friction was unavoidable in the act of walking, ulceration had taken place, giving rise to a most troublesome and offensive secretion.

These evils had been present some time before surgical aid was sought; and even then the case would not have come under my care but from the parochial medical officer, Dr. Dusautoy, being incapacitated by serious illness from taking charge of it.

From the rarity of the disease in this country, I was anxious to avail myself of whatever aid I might obtain from my professional brethren, and a meeting of the Fellows of the Royal College of Surgeons occurring soon after I had undertaken the care of the case, I brought the patient to town for their inspection. He was seen by a large number of the Fellows, nearly all of whom agreed with me in advising the removal of the morbid growth. As many who were wishful, were unable at the time to see the case, it was temporarily transferred to Mr. Fergusson's care, at King's College Hospital. Subsequently the patient returned to Southampton.

At this period the tumour (the dimensions of which have already been given) was ascertained to weigh, when suspended by means of a steelyard, more than fifty pounds. The prepuce presented a remarkable, nodulated appearance, and the extremity was so curved or involuted by means of the frænum, that on a superficial examination it was liable to be mistaken for the penis itself. Through this involuted, exaggerated portion of the prepuce, the urine dribbled away at times; on some occasions the passage would become distended, and the patient eject the secretion in a long, continued, fine stream. A finger could readily be passed through the external opening, and introduced to the extent of five or six inches; and at the extremity of the canal formed by the elongated prepuce, the glans penis could easily be detected. The scrotal portion of the diseased structures extended from a little above the symphysis pubis to within a few inches of the anus. This portion was nodulated in parts, with smooth intervals; and here and there the surface was scarred with cicatrices of old and recent standing, arising from the eruption already described. On the right side, and at the most dependent part of the growth,

there were indications, it was thought, of a considerable quantity of fluid. On the left side a very large hernial swelling could be recognised without difficulty. This rupture was regarded by myself, and many eminent surgeons who had handled it, to be of a reducible character; and the patient himself entertained a similar opinion, believing that he could return the gut at will.

An operation for the removal of the abnormal mass being determined upon, the first consideration was the practicability of devising some means of diminishing the risk arising from hæmorrhage. Mr. T. Spencer Wells, who was on a visit to me at the time, suggested the construction of a large clamp, formed of two moveable parallel bars, connected by a screw at each extremity; and by the application of which across the neck of the tumour, it was thought that not only the hæmorrhage might be controlled to a great extent, but also the hernial protrusion retained within the abdominal cavity. Means were also adopted to drain the tumour, as far as practicable, of blood. To this end, an iron rod, to which was attached a sliding hook, and tackle and fall for elevating and depressing the mass, as circumstances might require, was firmly fixed to a beam in the ceiling of the room occupied by the patient. By this means, on the day of operation—September the 21st—he being placed on a suitable table, the tumour was well elevated above the level of the body, and kept in this position, surrounded by ice, from 8 a.m. until 2 p.m.; then chloroform was cautiously administered by my fellow-townsman, Dr. Palk, and at 2.20 the operation was commenced.

The clamp being adjusted across the neck of the tumour, a long, curved, sharp-pointed bistoury was introduced into the canal of the enlarged and elongated prepuce, and this was slit up to the point where the glans penis had been previously ascertained to be embedded in the mass. A perpendicular incision, about eight inches long, was made along the dorsum penis to the symphysis pubis. An attempt to introduce a staff into the urethra, with a view to draw the penis up behind the pubic arch, and so

facilitate its subsequent dissection from the surrounding parts, failed. The penis was next seized, rapidly and easily detached, and dragged out of harm's way.

An incision was then made on the right side of the tumour, fourteen or sixteen inches in length, and extending from the lower extremity of the perpendicular cut to the most depending part of the mass. Next the forefinger of the left hand was thrust deeply into the wound, and served as a guide upon which was directed a stout, long, blunt-pointed bistoury, with which the deep-seated structures, the thickness of which averaged from four to five inches, were cut open. Large quantities of serum flowed from the blubber-like structures exposed at each stroke of the knife. The right testicle was found towards the middle of the last incision. It was carefully dissected upwards to near the right inguinal ring, and given into the charge of an assistant.

A similar method of procedure was adopted over the left side of the tumour, but in the confusion of parts there, the testicle was wounded before it was recognised, and the hernial sac opened. The sac was found to be occupied by several coils of intestine, but these had escaped injury from the knife. The pressure of the clamp was immediately diminished, and every effort exerted to return the gut within the abdominal cavity, but without success. It was then determined to remove the tumour in two portions. To effect this object the mass was transfixed, from before backwards, by a long catlin—the point of the knife being brought out in the centre of the perinæum, within two or three inches of the anus. The whole of the mass on the right side was now swept away; then the hernial sac was cautiously dissected out, and, with a few strokes of the knife, the left portion of the tumour was speedily removed.

About ten or a dozen ligatures were required to arrest the bleeding from several very small arterial branches—the only important one being the left spermatic artery, which necessarily required a ligature after the removal of the wounded testicle. The sides of the opening in the sac

were brought together by three stitches; many parts of the divided surfaces were drawn into tolerably good apposition by means of a few sutures; a dressing of lint saturated with oil was made use of; and, finally, the patient was removed from the operating table and conveyed to his bed.

The time occupied in the removal of the tumour was about twenty-one minutes; the ligaturing of arteries, apposition of parts, and dressing, extended over twenty-five minutes more.

The amount of blood lost during the operation was estimated at from thirty to forty ounces. This trifling loss of blood was to be attributed to the admirable manner in which Mr. Spencer Wells regulated the pressure of the clamp, and to the rapidity with which Messrs. H. Smith, Mason, Carr Jackson, and Orsborn followed every stroke of the knife, and most effectually controlled the mouths of the bleeding vessels. The solid portion of the tumour, after removal, weighed nearly thirty pounds.

The following notes of the after-treatment of the case, taken from my case-book, were made by my assistants.

At 5 p.m., two hours after the operation, the pulse was 100, and somewhat feeble. An anodyne was given consisting of one drachm of laudanum in half an ounce of brandy and water. This was presently rejected.

10 p.m.—The patient was restless and complained of pain in the back; ℥xxx Tinct. Opii to be taken in half an ounce of brandy and water every two hours. The first dose was retained a short period. He took iced water freely, and slept three hours during the night.

Sept. 22nd.—The irritability of the stomach still continued; pulse 130; respirations twenty per minute. Soda water and brandy, or a mixture of Chloric Æther and diulte Hydrocyanic Acid to be taken every three hours. Irritability of the stomach somewhat diminished; he took a small quantity of beef tea which was, however, very speedily rejected.

6 p.m.—Bathed in a profuse perspiration; became talkative but was rational. Port wine, brandy, and laudanum,

to be given at regulated intervals. Slept about two hours during the night.

23rd, 2·30 a.m.—Four ounces of urine were passed, and he expressed himself greatly relieved; much gratified by holding the penis, which he had not done before for ten years. Pulse 120; continued to take iced soda-water and brandy, and small doses of laudanum.

5·30 a.m.—Passed six ounces of urine.

6 a.m.—Complained of slight pain in the stomach; slept very little since midnight.

8 a.m.—Passed urine; slight pain in the abdomen, the pulse being 120, full and strong.

10·30 a.m.—Passed twelve ounces of urine.

11 a.m.—Complained of pain in the chest, which was relieved by the hydrocyanic acid mixture.

1 p.m.—Took an egg and wine.

2·30 p.m.—Irritability of stomach greatly diminished.

3 p.m.—Passed a motion in bed; milk and brandy to be given every two hours.

5·30 p.m.—Passed a copious, well-formed motion; pulse 120, full and strong.

24th, 3 a.m.—Had a little sleep, and passed urine freely; stated that he felt much better and stronger.

6·30 a.m.—Passed urine; took an egg beaten up in tea, and a slice of toast, slept again for an hour or more.

11 a.m.—Pulse 119; passed urine copiously; irritability of stomach troublesome.

2·40 p.m.—Passed a copious and healthy-looking motion; complains of slight pain over the abdomen; ordered turpentine stupes; pulse 130, very full.

25th.—Did not pass so good a night as the last.

8·30 a.m.—Pulse 100, tongue moist, abdomen painful and slightly tympanitic.

2·30 p.m.—The wounds were dressed for the first time since the operation; the hernial sac and the penis were covered with healthy pus; a little spirit of turpentine was added to the dressing.

5·30 p.m.—Appears comfortable; very communicative.

6 p.m.—Passed a good motion and a large quantity of urine.

11·45 p.m.—Abdomen became greatly distended; the respiration and the whole system disturbed.

12 p.m.—Passed a motion, with great relief to the painful abdominal distension; irritability of stomach returned; vomiting; pulse 110; tongue moist and clean.

26th, 2·30 a.m.—Passed another good motion; slept for an hour and a half.

3·30 a.m.—Vomiting and distension of abdomen increased; hot turpentine stupes made use of, and the hydrocyanic acid mixture with milk and brandy.

6 a.m.—Very restless; great augmentation of abdominal distension; pulse 120; tongue clean and moist; complains of great prostration; takes alcoholic beverages freely, but the stomach will not retain them.

8 p.m.—Abdominal distension still greater; extreme difficulty of breathing.

10 a.m.—Expired somewhat suddenly.

Examination of the body on the morning of the 27th.—The abdominal cavity and the hernial sac and its contents were alone submitted to inspection. The former presented no morbid appearance, except an enormously distended condition of the intestines. The latter showed the nature and extent of the mischief which had caused death. The sac measured in its longitudinal (antero-posterior) circumference nearly thirty inches, and in its horizontal circumference about twenty inches; it was unusually thickened, in some parts to the extent of half an inch. The contents consisted of large coils of small intestine firmly matted together by old adhesions; and the cæcum and appendix vermiformis were tightly bound by fibrinous bands, of long standing, to the upper and outer portion. There was no strangulation nor discoloration of the gut at the mouth of the sac, and the finger could be readily passed around the intestine occupying it; but the areolar tissue in the vicinity of the accidental incisions, as well as the lowermost coils of the protruded gut were gangrenous. This was unquestionably the cause of death.

An examination of the tumour, made soon after its removal, by Mr. Flower, of the Royal College of Surgeons, showed the following characters:

The substance consisted almost entirely of fibro-cellular tissue, abundantly infiltrated with serum, and containing in some parts fat, collected in roundish masses, but not in any large quantity. Externally, it was directly continuous with the deeper layers of integument.

Microscopically the structure could scarcely be distinguished from that of ordinary connective tissue, consisting of bundles of very delicate, colourless, wavy filaments, with a few scattered nuclei among them. It was gelatinized by acetic acid, presenting after the addition of that reagent a soft-looking homogeneous mass, with scattered granules and nuclei, and a few blood-vessels and elastic fibres. These last were very sparingly found, except in the dermal portions of the tumour.

Such is a history of this case and of the proceedings which were adopted in its treatment. The rarity of scrotal elephantiasis in this country will, perhaps, justify the addition of a tabulated summary of the chief recorded instances of the affection.

	Authority.	Age.	Native of what country.	Dimensions.	Weight.	Especial points of interest.	Treatment.	Result.	Examination of growth.	References.
1	Dionis (died 1718)	—	Negro, Pondicherry	1 ft. 3 in. length; ditto breath, 3 ft. 6 in. circumference	60 lbs. (estimated)	Uneven, and hard as a stone	—	—	—	'Cours d'Operations de Chirurgie démonstrées au Jardin Royal,' 2de ed.
2	Cheselden	—	Negro	—	—	Enormously developed scrotum	—	—	—	Depicted in 4th ed. of 'Anatomy.'
3	Walther	—	—	—	40 lbs. (nearly)	Descended to knees	—	—	Skin of scrotum 3 inches thicker than natural; cellular membrane surrounding testicles distended by a viscous fluid	—
4	Morgagni	—	—	—	—	Refers to tumour as large as the heads of two men joined together. Mentions points of another tumour	—	—	—	'Epistolæ Anatomicæ,' xliii, Art. 42.
5	Michie de la Touche	70	—	1 ft. 6 in. length, 3 ft. 1 in. circumference	—	—	—	—	—	—

6	Chopart	50	Negro, Guinea Coast (resident twenty years at Martinique)	2½ ft. length, 2 ft. 2 in. circumference of upper part, 3 ft. 2 in. circumference of lower part	40 lbs.	Scrotum reached to the ankles	—	—	—	'Traité des Maladies Chirurgicales.'
7	Raymondon	40	—	23 in. length, 32 in. circumference of largest part	29 lbs.	Thirteen years growing to this size. Caused neither pain nor inconvenience, except from weight	Punctured; removed. Penis and right testicle (diseased) taken away	Death six hours after operation	—	Referred to by Chopart.
8	Imbert de Lonnes	—	Frenchman. (A minister of State)	—	30 lbs.	Tumour had existed fourteen years	Removed. Operation lasted two hours and a half	Recovery	—	—
9	Larrey	—	—	—	—	Details several cases in his account of the Egyptian campaign. Operated successfully in one case	—	—	—	'Mémoires de la Chirurgie Militaire,' vol. ii. p. 110.
10	Hendy	50	Negro, Barbadoes	24 in. length, 6 ft. circumference	—	Surface of mass rough and uneven. Felt to the touch as if it contained half-coagulated fluid. No part of penis could be discovered. Urine voided at an opening 20 inches from pubis	—	Mortified. Death	—	(Dr. Hendy knew of five other cases in which the scrotum sloughed, so as to denude the testicles.)

	Authority.	Age.	Native of what country.	Dimensions.	Weight.	Especial points of interest.	Treatment.	Result.	Examination of growth.	References.
11	Corse	—	Hindoo	25 in. length, 38 in. circumference of middle, 14 in. circumference of root, 20 in. circumference near the end	—	—	—	—	—	—
12	—	—	Negro (?)	—	—	Scrotum so excessively developed, that the patient was obliged to keep constantly in bed	—	—	—	'Phil. Trans.'
13	Dadd	—	Native of Africa (West Indies)	Penis alone affected; 14 in. length, 12½ in. circumference	—	—	—	—	—	—
14	Titley	—	Negro	29 in. length, 43 in. circumference	70 lbs.	Descended to within an inch of the ground, dragging down the abdominal integuments. Surface equal and smooth, superficial veins much enlarged	Removed. Penis dissected out, testicles cut away with the mass	Recovery	Testicles occupied normal position. Left testicle enlarged; tunica vaginalis of right testicle contained three pints of fluid. Scrotum from two to four and a half inches in thickness; cavity filled with a gelatinous matter, which formed a jelly on cooling. Substance of scrotum and investment of spermatic cords, infiltrated with like matter.	'Pract. Treatise on Diseases of the Genitals of the Male,' Lond., 1829, pp. 312-314. N.B.—Dr. Titley operated in five other cases, in all of which the operator was successful. He also mentions several cases successfully operated on by Dr. Caines.

15	Ditto	—	Negro (?) (St. Christopher's)	—	165 lbs.	Not under Dr. Titley's care	Removed	Death	—	—
16	Ditto	—	—	20 in. length, 44 in. circumference	—	Ditto	Removed	Death	—	—
17	Liston	22	—	42 in. circumference, 40 in. from verge of anus to pubis	44 lbs.	Skin coarse and much stretched; extended beneath patient's knees. Urine escaped through the fissures of a large warty mass	Removed. An attempt to save some portions of the genital organs obliged to be given up from the enormous hæmorrhage	Recovery	Substance of tumour dense, resembling in appearance the mammary gland. Same character pervaded all the tissues	'Edin. Med. Journ.,' 1823.
18	Wells	30	Negro	—	10 lbs.	—	Removed. Penis and testicles saved. Veins numerous and enormously large; hæmorrhage considerable. One vein as large as vena cava. The patient "did remarkably well after the operation, and went home in three months—et satis ad veneram pollebat"	—	—	'Amer. Journ of Med. Science,' May, 1828.

	Authority.	Age.	Native of what country.	Dimensions.	Weight.	Especial points of interest.	Treatment.	Result.	Examination of growth.	References.
19	Cloт. Bay	—	—	—	110 lbs.	—	Removed	—	—	'Travaux de l'Ecole de Méd. d'Abou, Zabel, Egypte,' Paris, 1835, p. 131.
20	Delpech	—	—	—	60 lbs.	—	Removed	Wounds healed up in two months. Patient returned home; after a few fur weeks fell ill and died; a large abscess found in liver	— Patient re-ther's Chirurgie und Augenheil-kunde,' vol. ii. p. 617.	Von Graefe und von Walther's 'Journal
21	Aston Key April, 1831.	32	Chinese	4 ft. circumference	56 lbs.	Growth of ten years; involving genitals.	Removed. An attempt to save the genitals failed	Death	Hypertrophied integuments and connective tissue.	'London Medical Gazette,' vol. viii. p. 93. Preparations in Museum of Guy's Hospital. No. 1052*.

The following notes may also prove of interest:

M. Seuts-Amdial extirpated a tumour of the scrotum of enormous size, at Rio Janeiro, in 1843, with only a trifling loss of blood. The tumour weighed 143 pounds, and the patient recovered.

Dr. Goodwin, of Calcutta, removed a scrotal tumour weighing upwards of fifty pounds. The patient only lived six hours, the hæmorrhage being uncontrollable.

Dr. O'Brien, who has, or had, charge of the Hospital for Elephantiasis, in Calcutta, states that the largest scrotal tumour coming under his observation was two feet in length, and five feet in circumference; it weighed ninety pounds, including a hydrocele which, he says, is almost always present in the affection. Dr. O'Brien, when operating in these cases, always placed the patient under the influence of chloroform, but kept a galvanic battery at hand; because, he states, the weight of such a tumour naturally drags the abdominal walls to a vast extent, and when the tension and pressure are removed, there is relaxation of these tissues, and consequent collapse of the diaphragm. He describes a case in which the patient, who had not lost a pint of blood, and had been only four minutes and a half under chloroform, was declared dead by his assistants, but was brought round by the use of the battery. 'Dublin Hospital Gazette,' January 1, 1857.

Mr. Godfrey, superintending surgeon in the East India Company's service, removed an immense scrotal tumour from a native, aged thirty, residing in the suburbs of Madras. The length of the tumour was twenty-six inches, the circumference a yard and a half. The operation was performed thus:—A piece of stick was passed into the preputial orifice as a director, and an incision made down to the penis. Another incision was then carried obliquely from the right groin to join the first incision. On continuing this incision, however, the gush of blood from some large veins was so terrific and uncontrollable, that to save the patient's life the whole of the diseased mass was removed as speedily as possible. When the bleeding surface was

fully exposed, the hæmorrhage was checked by ligatures and pressure. The wound was closed by needles and twisted sutures. The case did well, the man making a good recovery. The tumour weighed seventy pounds.

Mr. Godfrey suggests (in order to effect the same purpose—the control of hæmorrhage—which in my case was aimed at by the use of the clamp) that, in operations of this character, a needle, carrying a strong ligature, should be passed through the neck of the tumour on each side of the penis. The ligatures being then firmly tied on the outer side, so that the two halves of the neck would be enclosed, the flow of blood during the operation might in some degree be checked.

Many other examples of scrotal elephantiasis are recorded in the journals. Dr. Esdaile, of Calcutta, has described numerous instances, and he must have operated in nearly 200 cases. In the 'Lancet' of 28th September, 1861, a case is published which occurred under the care of Mr. Fergusson, at King's College Hospital, and in which a scrotal tumour weighing six pounds, was removed with success. Again, in a recent number of the 'Edinburgh Medical Journal,' Dr. Fayrer, Professor of Surgery in the Bengal Medical College, in a most interesting paper on "The Scrotal Elephantiasis of Bengal," gives brief accounts of fourteen cases of the malady in which he operated between July, 1859, and September, 1861.

Of these cases, nine were cured, four died (three from pyæmia and one from shock), and one was still under treatment when his paper was written. The weight of the tumours removed varied from three pounds to sixty-six pounds.

Professor Fayrer's description of the operation of removal is peculiarly clear and instructive. He says:

"The operation for removal of a scrotal tumour is simple enough, but it requires determination and expedition. It needs also the aid of several intelligent assistants.

"Before commencing, it is well to have the tumour raised and supported in a vertical position for half-an-hour, to

drain it of blood as much as possible; then, the patient having been placed in a recumbent position on an ordinary table, with the nates brought near the end of it, he is to be put under the influence of chloroform, and the incisions are to be commenced.

"The instruments required are, a long steel director to guide the knife in cutting down to the penis, a large scalpel, an amputating knife, artery forceps, and plenty of silk ligatures; a few of the small bull-dog forceps also are useful in temporarily controlling inconvenient hæmorrhage from divided veins.

"Several assistants are required to hold back the legs, raise the penis and testes, support the tumour, and rapidly secure the numerous bleeding points. These being provided, the operation may be begun. The director is to be introduced into the passage at the bottom of which lies the glans penis, and that organ exposed, by laying open with either the long catlin, or a sharp-pointed bistoury, the dense tissue covering it. The prepuce is frequently found quite healthy and dragged forward. If so, it is well to reflect a portion of it as a future covering for the penis, which, if well managed in the subsequent dressing, becomes a better integument than the cicatrix tissue which must otherwise take its place. In the event of the prepuce being involved, or even suspected of being involved in the disease, it should be carefully dissected away like the rest of the thickened tissue. Having exposed the penis, it is to be raised and carefully dissected out, with or without the prepuce as the case may be; it must be carefully held back, and out of the way of the next incisions, by an assistant, and care must be taken in clearing it out of the morbid tissue, not to divide the suspensory ligament, or difficulty will attend the subsequent treatment in keeping it in its proper place with reference to the testes, which may be drawn by the granulation and cicatrization above the penis.

"The next step is to make a deep and bold incision down to the tunica vaginalis on one side. In a large tumour

several incisions will be needed before the tunica vaginalis is exposed, which probably will be found much thickened and distended with quantities of fluid, forming large hydroceles. These should be laid open, and if the tunica vaginalis be much thickened, it should be removed; if not so affected, and the testicle not enlarged, it need not be interfered with. The testicle, with or without the covering, according to circumstances, is then, like the penis, to be dissected out and reflected, being held upwards with the penis; a similar proceeding is to be carried out on the opposite side, and then, the genital organs being held up towards the abdomen, the tumour is to be removed by connecting transversely the three vertical incisions already made, and then, either with the scalpel or the amputating knife, the remaining portion of the neck of the tumour is to be cut through: it is well before separating it, to mark out on the perinæal aspect by an incision, the line at which the removal is to be completed. During the operation the bleeding vessels are to be commanded by the fingers of assistants, and subsequently ligatures (twenty to thirty are frequently necessary) are to be applied: any large vein may be controlled by the bull-dog forceps. It is well that even the most minute bleeding points should be ligatured; otherwise, when reaction occurs, there may be hæmorrhage, and it may be necessary to remove the dressings, whereby much suffering is occasioned to the patient. The bleeding having been perfectly controlled, the testes, with their elongated cords, often extended to the length of a foot or even eighteen inches and much thickened, are to be raised and applied to the surface of the wound; the penis is to be enveloped in a fold of oiled lint, and thus kept apart from the testes, which are also covered and supported in position by oiled cloths."

In the 'Ephemerides Germanicæ' is an account of a scrotal tumour which weighed 200 lbs. This is the largest on record.

Finally, I would direct attention to a curious old painting

Presented to the
Army Medl. Library
by Mr. le Docteur Jules Roux
Chirurgien en Chef
de la Marine
à Toulon
6 Mar 1861

LEÇON

SUR

LES APPAREILS A FRACTURE

ET A COMPRESSION.

CLASSES NOUVELLES;

APPAREILS POLYDACTILES — A CHEVILLES MOBILES;

COMPRESSEUR ÉLASTIQUE ET GRADUÉ.

ÉCOLE DE MÉDECINE NAVALE DE TOULON

LEÇON

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LES APPAREILS A FRACTURE

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APPAREILS POLYDACTILES — A CHEVILLES MOBILES;

COMPRESSEUR ÉLASTIQUE ET GRADUÉ;

PAR

LE DOCTEUR JULES ROUX,

Chirurgien en chef de la Marine à Toulon,
Professeur de clinique chirurgicale,
Membre correspondant de l'Académie de médecine,
De la Société de chirurgie de Paris, des Sociétés de médecine de Marseille,
De Brest et de Constantinople,
Membre de la Société académique de Cherbourg,
Officier de la Légion d'honneur.

PARIS

TYPOGRAPHIE FÉLIX MALTESTE ET Ce,

Rue des Deux-Portes-Saint-Sauveur, 22.

1859

Publications de l'Union Médicale, Novembre et Décembre 1858.

LEÇON

SUR

LES APPAREILS A FRACTURE ET A COMPRESSION.

CLASSES NOUVELLES ;

APPAREILS POLYDACTILES — A CHEVILLES MOBILES ;

COMPRESSEUR ÉLASTIQUE GRADUÉ.

En commençant notre entretien d'aujourd'hui, permettez-moi de lui donner, comme frontispice, deux épigraphes propres à en indiquer le but et à justifier ce que paraît avoir d'étrange, au premier abord, l'association de mon double sujet.

« L'habileté du chirurgien doit donc consister, essentiellement, à indiquer, à faire construire, et à mettre en jeu les meilleurs auxiliaires, les substitutions les plus convenables de ses *mains*, ou ceux qui ont le plus de rapport avec l'action admirable et si simple de ces dernières. »

Mathias Mayor, *Chir. simplifiée*, t. I, p. 148 (1841).

Vous le voyez, de l'étude d'un appareil polydactile à fracture, nous sommes arrivés, sans transition brusque, à l'examen d'un appareil de compression générale, au compresseur élastique et gradué. C'est que ces deux choses, loin de s'exclure, se complètent : *contenir*, *comprimer*, n'est-ce pas la formule des conditions essentielles des deux genres d'appareils qui, dans le système que j'expose, marchent parallèlement et se prêtent de mutuels services en s'empruntant, pour des résultats souvent différents, quelques-uns de leurs éléments ?

J. Roux.

Messieurs,

La chirurgie navale a trop souvent à intervenir dans les fractures si fréquentes dans les arsenaux, sur les bâtiments, parmi les troupes des divers corps de la marine, pour qu'il n'y ait pas une grande utilité à insister sur les moyens que l'art possède d'y

remédier et sur la possibilité de les compléter, de les perfectionner même, pour les applications qu'on peut en faire dans les campagnes et les villes, dans les hôpitaux, à la mer.

Quand on cherche à acquérir des notions précises sur les appareils à fractures des membres, on sent le besoin d'en faire en quelque sorte l'inventaire en les énumérant tous. Mais la multiplicité de ces appareils, les modifications plus innombrables encore qu'ils ont subies en vue de telle ou telle indication, rendent cette tâche presque impossible par l'obligation de réunir tous les documents épars dans les écrits anciens et modernes. A défaut de cette énumération, cherchons, en nous étayant des travaux les plus récents publiés en France, un ordre méthodique qui nous serve de classification.

Au commencement de ce siècle, les appareils à fractures n'étaient pas encore réunis en groupes distincts, puisque Thillaye, dans son *Traité des bandages*, les décrit isolément à l'occasion des bandages des membres.

M. Gerdy, en 1824, distribua avec plus d'ordre les bandages et les appareils en général, leur affecta des sections, des classes, des genres, des sous-genres, et rassembla ceux à fractures dans le 7me genre, 2me classe, section II, savoir : Bandages : *spiral, à bandes séparées, à* 18 *chefs*; — Appareils : *extensif, à double plan incliné*.

En 1844, M. le docteur Michel Thivet a fait paraître un volume qui se distingue par la précision et l'utilité pratique. Dans ce traité complet de *Bandages et d'anatomie appliquée à l'étude des fractures et des luxations*, l'auteur, après avoir établi trois classes de bandages : *simples, composés, mécaniques*, et avoir virtuellement rangé les appareils à fractures dans les deux dernières, décrit le plus souvent chacun d'eux suivant l'ordre d'apparition dans la science, à l'occasion de chaque fracture en particulier.

Le *Traité des fractures* de M. Malgaigne, publié en 1847, destiné à faire époque dans la science, consacre six classes d'appareils : 1° *attelles*, 2° *inamovibles*, 3° *en plâtre*, 4° *cuirasses*, 5° *hyponarthéciques*, 6° *à extension permanente*.

Dans son *Précis iconographique des bandages, pansements et appareils*, ouvrage aussi soigné dans la forme que complet dans le fond (1854), M. le docteur Goffres, médecin principal des armées, admet neuf genres d'appareils à fractures. Les bandages : 1° *spiral*, 2° *à* 18 *chefs*, 3° *à bandelettes séparées*; — les appareils : 4° *à extension continue*, 5° *à plans inclinés, 6° gouttières, boîtes, caisses*, etc., 7° *hyponarthéciques*, 8° *agissant directement et isolément sur les fragments*, 9° *inamovibles et amovo-inamovibles*.

Enfin, un de mes élèves, qu'un accès pernicieux contracté au Sénégal, vient d'enlever, trop tôt hélas! à la science et à l'affection de ses maîtres et de ses condisciples, M. Eugène Reynaud, chirurgien de 2me classe de la marine, dans sa thèse pour le doctorat soutenue en juillet 1857, à la Faculté de Montpellier, n'adopte plus que cinq classes, les appareils : 1° *à attelles*, 2° *inamovibles*, 3° *hyponarthéciques*, 4° *à extension continue*, 5° *mixtes*.

Mathias Mayor, dans son *Système de déligation chirurgicale*, dont l'originalité et le mérite sont justement appréciés, ne s'est bien occupé que d'un seul ordre d'appareils à fractures, de celui qu'il a appelé *hyponarthécique*. Il n'est pas inutile d'ajouter que les auteurs des traités généraux de pathologie externe et de médecine opératoire, s'étant inspirés le plus souvent des travaux spéciaux sur cette matière, ne contiennent rien de plus complet.

Il est assez difficile de saisir les principes qui ont servi de base à ces classifications. Thillaye a cédé à l'usage de fonder sur les divisions anatomiques du squelette les classification afférentes à la chirurgie; la similitude de la disposition des appareils, leur situation par rapport à la fracture, leur composition, leur forme,

la durée de leur application, leurs usages, la réunion de plusieurs systèmes, l'ordre chronologique même, etc., ont servi à MM. Gerdy, Thivet, Malgaigne, Goffres, E. Reynaud, à nommer et à disposer les classes, les genres qu'ils ont admis.

Voici la classification adoptée dans mon enseignement : sera-t-elle capable, par sa simplicité, de mieux faire aborder aux élèves l'étude des appareils à fracture, dont l'effrayante multiplicité est bien propre à décourager l'esprit, entretenir le doute, provoquer l'indifférence, et perpétuer dans la pratique l'appareil le plus classique, malheureusement trop remarquable par ses succès et ses revers ? Sera-t-elle susceptible, par sa clarté, d'éclairer le dédale de ces appareils et de vous diriger dans le choix du meilleur ? Jugement capital s'il en fût, puisque, porté au début de votre carrière, il vous dominera dans toute votre pratique ! Appréciation délicate par excellence, puisque, malgré les traditions les plus constantes et les enseignements les plus autorisés, il vous faudra ne pas perdre de vue que ce qu'il importe le plus de savoir, ce n'est pas s'il y a des appareils défectueux qui peuvent, sans trop de péril, rendre des services entre des mains très habiles, mais bien s'il en existe un facile pour tous et exempt de danger, même entre les mains les moins exercées !

Appareils a Fractures des Membres.

Classes.	Genres.	
I. A Attelles.	1° Spiral.	Gerdy.
	2° A 18 chefs	Verduc, Hôtel-Dieu de Paris.
	3° A bandelettes séparées. .	Scultet.
	4° A drap-fanon.	J. Roux.
II. Inamovibles.	1° En plâtre.	Dieffenbach.
	2° Avec l'albumine.	Larrey.
	3° L'amidon (amovo-inamov.)	Seutin, Morel-Lavallée.
	4° La dextrine.	Velpeau.
	5° Le papier.	Laugier.

III. Hyposarthéciques.	1° Coussins	Galien, Jobert (de Lamballe).
	2° Gouttières en fil de fer. . .	Mayor.
	3° Bottes.	Ravaton, A. Laforgue.
	4° Caisses	Baudens, D. Arnaud.
	5° Cuirasses	Lafaye, Bonnet (de Lyon)
	6° Hamacs.	J.-L. Petit, Scoutetten.
	7° Planchettes	Sauter, Mayor.
	8° Double plan incliné. . . .	Ast. Cooper, Delpech, Mayor, J. Roux.
	9° Lits { fixe	Amesbury.
	{ suspendu des vaisseaux. .	C. Forget.
IV. A Extension continue (agissant par)	1° Distension.	Hippocrate, Paracelse.
	2° Traction	Desault, Boyer, Roché, Baudens, J. Roux.
	3° Bascule.	Pott, Dupuytren, A. Cooper, Delpech, Mayor, J. Roux.
V. Polydactiles.	1° A chevilles mobiles. . . .	J. Roux.
	2° A pointes métalliques. . .	Malgaigne.

Dans cette classification, où l'on pourrait faire entrer tous les appareils, j'ai, dans un but pratique, conservé seulement ceux qu'on a le plus d'intérêt à connaître, soit parce qu'ils sont le plus employés, qu'ils sont plus susceptibles de l'être, soit enfin parce qu'on les trouve encore décrits dans les ouvrages les plus récents. Pour aider la mémoire, j'ai placé en regard de chaque genre le nom de l'inventeur, du propagateur le plus ardent, du modificateur le plus heureux, en laissant aux livres didactiques le soin de conserver, dans un historique impartial, l'ordre de priorité déduit de la marche progressive de l'esprit dans cette branche importante de notre art.

Entrons dans quelques détails : à la première classe, j'ai ajouté l'appareil à *drap-fanon*, qui se compose de liens, de deux attelles latérales enveloppées d'une pièce de linge contenant,

dans celles de ses duplicatures qui regardent le membre, le remplissage étoupe, ouate, coton, etc., etc. Je me suis arrêté à cette simplification, bien qu'il m'eût été facile d'en indiquer d'autres, car voyez quelle a été l'instabilité des appareils à attelles! Les chirurgiens, à l'envi, ont renchéri sur leur simplicité; M. Malgaigne en a rejeté la bande spirale, les bandelettes séparées (de Scultet), le bandage à dix-huit chefs, et n'a conservé que les attelles, le drap-fanon, les coussins, les liens. A l'appareil si simple de M. Malgaigne j'ai enlevé les coussins; mais voilà que M. le docteur Gaillard, de Poitiers, les lui restitue et lui ôte le drap-fanon et les liens! Ces modifications, si insignifiantes qu'elles soient, méritent d'être conservées dans les cas de fractures les plus simples, parce qu'elles tendent toutes vers les mêmes indications : laisser le membre à découvert, maintenir la coaptation des fragments osseux, empêcher la compressiou circulaire du membre, etc., etc.

Je dois avouer qu'à mon appareil à drap-fanon, j'attache une importance de plus, spéciale à la chirurgie des vaisseaux. En 1840, j'avais fait préparer, sur le *Montébello*, un grand nombre de ces appareils provisoires, pour servir, le jour de l'action, à panser avec rapidité dans les hunes, sur le pont, dans les batteries, les hommes atteints de fracture, afin de favoriser leur transport et de leur permettre d'attendre l'heure du pansement définitif. Ces bandages, de dimensions différentes pour s'accommoder aux divers segments des membres, seront utiles dans l'*appareil de combat* des vaisseaux, au même titre que les bottes en fil de fer que M. A. Laforgue, médecin militaire, a proposées dans le même but, pour faire partie du matériel des ambulances des armées.

L'appareil de M. Gaillard est composé d'*attelles*, et cependant il ne figure pas dans notre première classe, parce que, par sa

planchette, il tient davantage des appareils hyponarthéciques. Cet appareil, dont je désire vous entretenir, a paru d'abord dans la *Gazette médicale de Paris* (1850, page 262), ensuite dans une brochure publiée en 1857. En le voyant, on saisit aisément les rapports qu'il a avec notre appareil à chevilles mobiles, que le professeur de Poitiers n'a cependant pas cité, sans doute parce qu'il ne le connaissait pas, bien qu'il ait été publié avant le sien, et avec planches, dans la *Revue médico-chirurgicale* de M. Malgaigne, année 1849, page 90. Ces deux appareils présentent un plateau en bois, des trous, des chevilles; mais sous les traits de cette ressemblance, n'allez cependant pas les confondre, car, au fond, ils sont essentiellement différents. Pour M. Gaillard, les chevilles sont des *liens* propres à retenir les attelles inflexibles qui restent avec tous leurs inconvénients, tandis que, pour moi, les chevilles constituent des attelles digitales, indépendantes, avec tous leur avantages.

Dans mon tableau ne figurent pas deux classes admises par M. Malgaigne, celles des appareils en *plâtre* et des *cuirasses*, parce que la première rentre évidemment dans les appareils inamovibles, et la dernière dans ceux dits hyponarthéciques. Nous avons donné une interprétation un peu différente au huitième genre de M. Goffres : *appareil agissant directement et isolément sur les fragments;* jusqu'ici, comme l'auteur l'établit lui-même avec raison, « ces appareils sont presque toujours employés comme complément des autres. » L'un d'eux nous a paru mériter la place distincte que nous lui avons donnée parmi les appareils polydactiles.

Je n'ai pas conservé non plus la cinquième classe, *appareils mixtes* de M. Reynaud, classe où se trouvent groupés les appareils de MM. Baudens, Arnaud (1), J. Roux et celui de M. le professeur

(1) E. Reynaud, *Du traitement des fractures des membres inférieurs*. Thèse de Montpellier, juillet 1857.

C. Forget, de la Faculté de Strasbourg, que les médecins de la marine s'honorent d'avoir compté dans leurs rangs (1). La classification de M. Reynaud se distingue par les appareils *mixtes* qu'on ne trouve nulle part jusqu'ici. L'admission de cette classe nouvelle, pour être justifiée, suppose l'existence d'un système qui, tenant à la fois de tous les autres, mériterait ainsi la dénomination de *mixte*. Or, il faut en convenir, ces conditions se trouvent remplies par les appareils que M. E. Reynaud indique, et il vous suffira, par exemple, de jeter un simple coup d'œil sur celui à chevilles mobiles que vous avez sous les yeux, pour voir, ce que d'ailleurs nous démontrerons bientôt, qu'il tient des appareils à attelles, inamovibles, hyponarthéciques, à extension continue. Mais il faut reconnaître aussi que les appareils de chaque classe ne sont pas tellement limités dans leur action propre, que le plus grand nombre se rapprochant assez pour se suppléer, se confondre même dans quelques-unes de leurs applications, ne constituent également des appareils mixtes. Vous l'avez vu déjà par celui de M. Gaillard; vous l'avez compris aussi par les noms des auteurs dont le même appareil trouve place non seulement dans plusieurs classes, mais dans plusieurs genres d'une même classe; il serait facile de le démontrer pour la plupart des autres; dès lors, tout en convenant que la faculté d'être *mixte*, ailleurs toujours restreinte, est plus absolue dans les appareils que renferme la cinquième classe de M. E. Reynaud, nous n'admettons pas cependant cette dernière, au moins sous sa dénomination, parce qu'elle n'indique pas assez ce qu'il y a de spécial ou d'essentiel dans notre appareil polydactile. Laissant alors les *caisses* de MM. Baudens, Arnaud, le *cadre-lit* de M. le professeur Forget, parmi les appareils hyponarthéciques, nous constituerons, d'après les principes suivants, la cinquième classe de notre classification.

(1) *Médecine navale*, t. II, p. 456.

Dans tous les temps, les médecins, en appelant à leur secours les appareils à fractures, ont eu en vue de remplacer la main de l'homme ou d'en continuer le mode d'action. Cette intention est trop clairement accusée dans les livres et dans tous les appareils, pour qu'il soit nécessaire d'insister sur une longue démonstration. Deux choses dominent en général dans toute fracture : 1° l'altération de la forme; 2° l'indication de la rétablir; car, avec sa forme, le membre reprend ses dimensions, ses rapports. Pour obtenir ces résultats, le chirurgien emploie ses mains, ses doigts, emprunte ceux d'un ou de plusieurs aides, et, avec eux, il réduit la fracture, produit la coaptation, empêche les déplacements; en un mot, il rend au membre sa forme, ses rapports, ses dimensions. On l'a souvent répété, tout serait obtenu si, pendant les cinq ou six semaines qu'exige la consolidation d'une fracture, l'opérateur et les aides pouvaient laisser à demeure leurs doigts soutenant les parties, exerçant méthodiquement les tractions, les compressions, opérant les relâchements nécessaires, et cela en laissant le membre à découvert, en permettant de faire les pansements, les opérations convenables, etc. En présence d'une évidente impossibilité, il a fallu remplacer les mains et les doigts par des appareils, autant que l'art peut remplacer la nature!

Pendant de longues années, on a enveloppé les membres avec des appareils très compliqués, dont les nombreuses pièces, subordonnées les unes aux autres, formaient, avec le membre qu'elles absorbaient en quelque sorte, un tout si compacte, qu'il était désormais impossible de toucher à une partie sans remuer le tout, de modifier un détail sans altérer l'ensemble, c'est-à-dire sans défaire, visiter, refaire l'appareil tout entier. Dans ce système de déligation agissant en *masse* loin des regards de l'opérateur, on chercherait en vain les analogues de la main ou des doigts, on n'y trouverait tout au plus que l'inflexibilité de l'avant-bras ou

du bras que semblent reproduire les attelles solides, les bottes résistantes, les gouttières rigides, les formes inamovibles, invariables, etc., etc. Les gouttières en fil de fer, laissant le membre à découvert et conservant l'empreinte de la main et celle des doigts furent un progrès réel. Mais je crois que les cravates de Mayor, les liens coaptateurs de Baudens apportèrent de plus heureuses modifications aux appareils à fractures, en consacrant mieux l'isolement de chaque pièce et l'indépendance de leur action plus en rapport avec les exigences de la thérapeutique et le fonctionnement de l'ensemble de la main, que leurs auteurs voulaient imiter.

C'est cet isolement, c'est cette indépendance d'action que je me suis proposé d'agrandir encore en les rendant complets, absolus dans un appareil que je me suis efforcé de rapprocher, non de la main considérée en totalité, mais de chaque doigt pris en particulier, en substituant le détail à l'ensemble, ou mieux l'action des éléments *isolés* à l'action des éléments en *masse*.

Vous le voyez, Messieurs, des principes différents et des résultats dissemblables se rattachent aux appareils à fractures ou en découlent, selon qu'ils reproduisent les analogues des avant-bras, de la main, des doigts; les attelles, les gouttières, les formes inflexibles d'une part, les lacs extenseurs, contre-extenseurs, coaptateurs, les cravates d'autre part, enfin les chevilles, ne sauraient être d'un emploi indifférent et marcher sur la même ligne, bien qu'il soit admis que le chirurgien habile se serve avec avantage de tous les instruments.

En proposant, dans un appareil mécanique, de remplacer les doigts si parfaits par des chevilles si imparfaites, j'ai dû ne pas m'arrêter devant une analogie choquante sans doute, et chercher les traits de la ressemblance dans les résultats bien plus que dans la forme. D'après ces considérations préliminaires indispensables

pour tous, j'espère qu'on trouvera moins étrange que j'appelle mon appareil à *chevilles mobiles* pour exprimer le fait, le genre, et *polydactile* pour rendre l'idée, désigner la classe.

En plaçant dans la classe des appareils polydactiles l'instrument à pointe métallique de M. Malgaigne, je crois lui avoir assigné sa véritable signification. Ces pointes, en nombre variable, offrent une des circonstances rares où l'art est, sous quelques rapports, supérieur à la nature, car, en définitive, elles maintiennent la coaptation mieux et avec moins de désordres locaux dans les parties molles, que ne le feraient un ou plusieurs doigts exerçant des pressions fortes et continues sur un même point, pendant tout le temps qu'exige la formation du cal.

Abordons maintenant l'étude de l'appareil à chevilles mobiles et indiquons successivement :

1° Sa description,

2° Son application et son mode d'action,

3° La manière dont il se comporte dans tous les cas de fractures et principalement dans celles dites *compliquées, comminutives, graves*. Nous parlerons de l'appareil de compression quand naîtra l'indication de l'appliquer aux fractures elles-mêmes.

1° *Description de l'appareil.* — Voici les pièces qui le composent :

(Planche I.)

Fig 1.

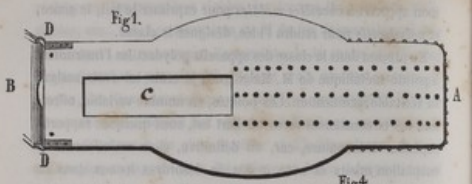


Fig 4.

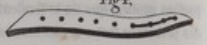


Fig 2.

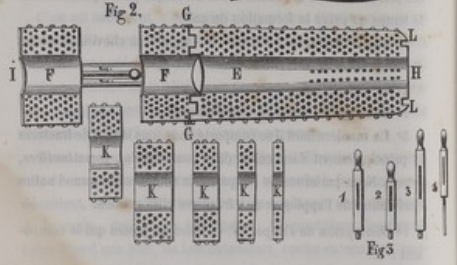


Fig 3

Figure 1. — Représente un plateau en bois, long de 1 mètre, large de 0,30 à ses extrémités et de 0,38 dans sa partie moyenne élargie en vue d'une plus grande stabilité. Son épaisseur, de 0,02 vers l'extrémité A, n'est plus que de 0,01 à son extrémité B. Ce plateau, vide dans sa partie C pour lui donner plus de légèreté et plus de fixité sur le matelas, est garni sur ses bords, en avant seulement, de petites pointes à tête ronde. Les *trous* dont il est percé sont, sur les trois lignes du milieu, parallèles, séparés les uns des autres de 0,01 et servent à recevoir un treuil, des chevilles

à turion uniforme, et au besoin des cordes pour suspendre tout l'appareil. DD, charnières latérales en fer, à tête de compas, destinées à réunir le plateau à l'extrémité I de la pièce fig. 2. Les trous qui, sur d'autres modèles, entourent le plateau servent, au besoin, à recevoir l'appareil de compression (v. pl. 7).

Figure 2. — Offre une planche en bois brisée en deux planchettes inégales, l'une *jambière*, E, l'autre *crurale*, FF, articulées en GG par une charnière en bois fixée par une double broche à écrou mobile. — Cette planche se superpose au plateau, s'articule avec lui, en le dépassant de 0,01 vers son extrémité B.

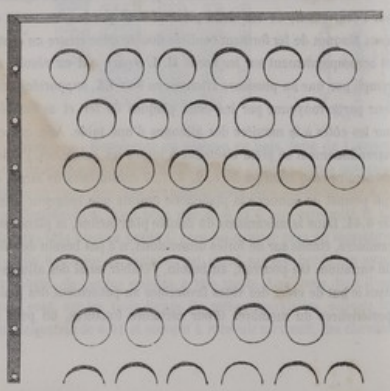
La planchette jambière est longue de 0,52, large de 0,20 à son extrémité H, épaisse de 0,02.

La planchette crurale de 0,23 de longueur, de 0,25 de largeur à son extrémité I, a 0,02 d'épaisseur, excepté à cette même extrémité I, où elle est fortement creusée en gouttière dans sa portion moyenne seulement. Pour s'accommoder aux dimensions variables de la cuisse chez les divers malades, la planchette crurale s'agrandit par l'écartement de ses deux pièces FF et par le glissement de deux plaques de fer formant coulisse double avec rivure au centre et accompagnement sur les bords JJ. L'espace qui en résulte est rempli par une ou plusieurs allonges en bois KK, supportées dans leur partie moyenne par les deux plaques de fer et assemblées sur les côtés à la manière des allonges d'une table. Afin que cet agrandissement se prête aisément à toutes les exigences, j'ai fait construire cinq allonges de 1, 2, 4, 7, 7 centimètres de large, ce qui permet de donner à la planchette crurale une longueur totale de 0,44. Dans le mécanisme du double plan incliné, la planchette jambière, établie sur de fortes dimensions, n'a pas besoin de subir de variation. On pourrait, au besoin, y établir aussi des allonges, dans le but de créer des vides favorables au pansement des plaies postérieures du membre. (Pour certaines fractures, on peut se

servir seulement de la planchette jambière qu'on peut aisément séparer de la planchette crurale.) — Les côtés de la planchette et des allonges, excepté en arrière, sont garnis, en ceinture, de petites pointes à tête ronde, distantes de 0,018.

Les trous dont elles sont criblées affectent une disposition qu'il est important de bien apprécier : ces trous, de 0,01 de diamètre, sont disposés sur les deux côtés en lignes droites et parallèles transversalement, obliques et non parallèles dans le sens longitudinal. Ils sont à 0,003 les uns des autres dans le premier sens, à 0,004 dans le second; ils sont rangés en séries percées à des hauteurs différentes des bords de ces mêmes planchettes et allonges; et leur arrangement est tel, que les chevilles qui s'y implanteront pourront suivre les contours du membre vers lequel elles procéderont de 3 en 3 millimètres. Un dessin de grandeur naturelle, reproduisant une portion d'un seul côté d'une planchette, fera, mieux que la description la plus complète, comprendre ces détails.

(Dessin.)



Les deux rangées de trous qu'on voit sur la portion moyenne de la planchette jambière, figure 2, recevront des chevilles qui pourront tenir lieu de *semelle*.

A l'extrémité de cette planchette sont deux entailles LL de la largeur des chevilles pour maintenir la flexion de l'appareil, et empêcher les mouvements de latéralité.

Figure 3. — *Chevilles*. Il y en a de trois sortes : différentes par le nom, le nombre, les dimensions, les usages,

Crurales 1.4,	au nombre de	36,	hauteur	0,25,
Jambières 2,	*id.*	42,	*id.*	0,22,
Supports 3,	*id.*	3,	*id.*	0,38,

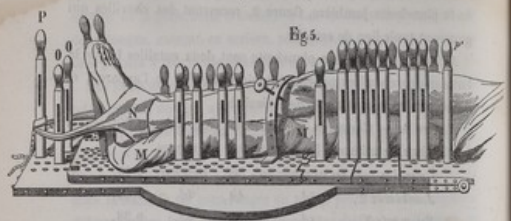
elles se ressemblent : 1° par la *forme*, qui est la même pour toutes; 2° par le *turion*, qui est toujours de 0,01 de diamètre sur 0,02 de hauteur, afin de s'adapter indistinctement à tous les trous de l'appareil; 3° par les *mortaises*, plus ou moins étendues, mais à égale hauteur du turion; 4° par les *faces*, qui sont de 0,02 de large pour celles qui portent les mortaises et de 0,018 pour celles des côtés.

Figure 4. — *Béquillon* accessoire avec trous et mortaise, de 0,35 de long, de 0,04 de large, de 0,01 d'épaisseur, pouvant se fixer à l'un des côtés de l'extrémité I de la planchette crurale à l'aide de deux chevilles crurales à turion suffisamment allongé, 4. Il permet, dans quelques cas, de prolonger l'appareil jusqu'au-dessus de la hanche, rappelant ainsi la disposition de l'extrémité supérieure de l'attelle de Roché, règlementaire à bord des bâtiments de l'État. (Voyez pl. IV, fig. 9.)

Figure 5. — Montre le membre droit fracturé étendu dans l'appareil, en extension continue, le tibia comprimé par la pointe métallique. — MM Coussin très épais, en coton, avec ou sans découpures profondes et multiples sur les bords, entourant les trois quarts du membre et le dépassant aux extrémités.—N Étrier

(Planche II.)

Fig 5.



(modèle Gariel). — OO Chevilles de réflexion des lacs. — P *Cheville-support* opérant l'extension continue par l'enroulement des lacs qu'on arrête aux pitons du plateau. La contre-extension s'exerce à l'arcade du pubis, par la première cheville crurale *p*, qui est, à cet effet, cylindrique et entourée d'un étui matelassé.

Fig 6

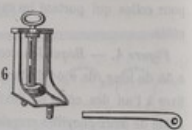
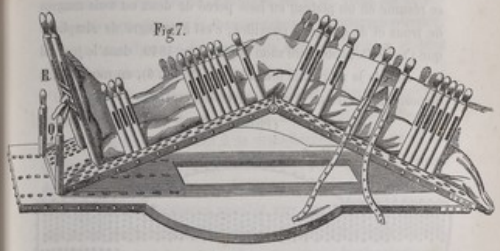


Figure 6. — *Treuil mobile* que fixent solidement au plateau, dans les trous de sa ligne moyenne, les deux turions retenus par une seule clavette ; dans les grands efforts de traction, ce treuil doit remplacer la cheville-support. Il a l'avantage, en se mobilisant, de rendre toujours directe ou parallèle à l'axe du membre la traction qui s'exerce dans la demi-flexion. Son axe vertical, de 0,14 de hauteur, présente, à l'extrémité inférieure, un rocher; à la supérieure, un anneau qui permet de le faire tourner avec la main seule ou aidée d'une tige de fer.

Figure 7. — Retrace le membre dans la demi-flexion. Des chevilles Q plantées dans les trous du plateau et enchassées dans les entailles terminales de la planchette jambière, retiennent celle-ci

(Planche III.)

Fig 7.



au degré d'inclinaison qu'on désire. Des chevilles-supports R, placées derrière le pied, sur cette même planchette, et garnies d'un coussin, tiennent lieu de semelle : si, d'ailleurs, ce qui est plus simple, on ne préfère, comme ici, soutenir le pied avec une pièce de linge tendue entre ces mêmes chevilles, placées alors sur les côtés et servant en même temps à garantir le pied contre le poids des couvertures dont les autres chevilles préserveront le reste du membre qu'elles dépassent. Cette disposition remplace les cerceaux inséparables des autres appareils, évite le refroidissement, maintient mieux autour des parties blessées une température uniforme. *r* Lien coaptateur.

L'appareil à chevilles mobiles, que la description précédente peut faire croire compliqué, et qui l'est, en effet, quand il doit servir à la fois, dans les hôpitaux, à l'extension et à la demi-flexion, à des malades nombreux susceptibles de présenter toute l'échelle des dimensions possibles des membres en longueur et en épaisseur, est, au contraire, d'une incontestable simplicité lorsque, dans les campagnes et dans les villes, il est destiné à un seul blessé et pour l'extension seulement que bien des chirurgiens.

M. Nélaton entre autres, préfèrent à toute autre position. Alors il se résume en un plateau en bois percé de deux ou trois rangées de trous et de quelques chevilles; c'est à ce degré de simplicité que j'avais fait connaître mon appareil en 1849, dans le journal déjà cité. Je le reproduis plus bas (pl. IV, fig. 8), en modifiant la disposition des trous, et supprimant le treuil.

(Planche IV.)

Fig 8

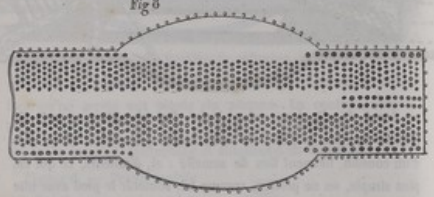


Fig 9.

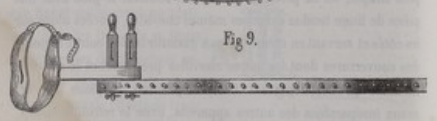


Figure 9. — Montre le côté du plateau avec le béquillon en place, retenu par deux chevilles crurales et une ceinture.

Ainsi établi avec un seul plateau criblé de trous, fig. 8, et au besoin avec un treuil terminal, pl. II, fig. 6, l'appareil à chevilles mobiles sert dans l'extension du membre et constitue une machine si puissante de *traction* qu'il mérite de trouver place dans le deuxième genre de la quatrième classe de notre tableau.

J'ai fait construire aussi un modèle d'appareil à chevilles mobiles, ne servant que dans la demi-flexion. Il ne diffère du double plan incliné que j'ai déjà figuré dans la planche III, que par la

double charnière qui unit le plateau à la planchette crurale, et permet à cette dernière de se rabattre sur le lit. Dans ces conditions, mon appareil, avec sa charnière propre, les allonges crurales, se range naturellement dans ceux dits *hyponarthéciques* et dans ceux à *extension continue* agissant par *bascule*.

Cependant, j'ai trouvé préférable de réunir en un seul ces deux appareils, de telle sorte que, dans un même traitement, l'*extension* pût succéder aisément à la demi-flexion, *et vice versâ*. Et comme j'établis en principe fondamental que, dans les fractures de cuisse, tout appareil supportant le membre tout entier, doit avoir le moins d'épaisseur possible vers l'extrémité ischiatique, *afin de ne pas relever le fragment supérieur*, il m'a fallu réduire, en ce point, à de faibles dimensions, le plateau, la planchette crurale, et porter sur les côtés les charnières d'union.

C'est ce dernier appareil, planches II et III, que j'emploie de préférence comme appareil à *extension simple*, comme double plan incliné *hyponarthécique*, comme appareil à *extension continue* agissant par *traction*, par *bascule*, enfin, comme appareil *polydactile* à *chevilles mobiles*, auquel j'ai associé quelquefois l'*instrument à pointe métallique* de M. Malgaigne, planche VI, tel que je l'ai modifié. (V. pl. 11, fig. 5.)

Certainement tout n'est pas nouveau dans cet appareil; la plupart de ses pièces constituantes se retrouvent dans des appareils classiques; je n'ai fait en quelque sorte que les remanier, en les disposant d'une manière un peu différente; mais, à ces éléments anciens j'ai ajouté un élément nouveau, la *cheville-doigt*.

Afin de ne rien laisser dans l'ombre sur ce dernier point, signalons, en les faisant remonter à leur origine, quelques particularités de notre appareil, qu'après bien des recherches, nous avons rencontrées dans les livres. Du temps d'Hippocrate, une *cheville* sous chaque aisselle, ou une *cheville* unique contre le périnée servait

à la contre-extension (1). Dans les temps modernes, Arnauld a rajeuni cette pratique, en plantant au centre du lit un *pieu* garni de linge. Dans la machine de Bellocq il y avait un point d'appui analogue (2). Mayor a proposé de soutenir les couvertures avec le montant terminal de sa planchette, un fragment de cercle, une *cheville* (3). On lit dans une note du livre de M. Malgaigne, p. 234, *Œuvres chirurgicales* d'Ast. Cooper et B. Travers : « Le châssis » inférieur est remplacé par une planche et la crémaillère par des » trous dans lesquels une *cheville* sert à arrêter la planchette de » la jambe. » Mais, je le demande, que sont ces détails par trop secondaires, traces éphémères d'idées souvent presque aussitôt abandonnées que conçues, en regard du principe qui substitue l'action des éléments isolés à l'action des éléments en masse ? Enfin Mayor a parlé aussi d'*allonges* (4), mais, tandis que le chirurgien de Lauzanne agrandit son appareil *pour toutes les fractures* (appareil d'ailleurs qu'il s'est empressé d'abandonner) à l'aide de deux planchettes à tiroir glissant l'une sur l'autre dans une coulisse, comme les deux planches fémorales du lit d'Amesbury, ce qui produit nécessairement un plan inégal, j'emploie des allonges en tout semblables à celles de nos tables, qui laissent un plan entièrement uni.

Appliqué aux solutions de continuité des os des membres supérieurs, aux fractures compliquées, avec écrasement (car l'art abonde en appareils très efficaces, dans les cas de fractures simples), l'appareil à chevilles mobiles présente des modifications faciles à pressentir en raison du volume, de la configuration, de la direction des articulations de ces membres, etc. De longs détails sur ces

(1) Thivet, *Traité des bandages*, p. 518.
(2) Malgaigne, *Traité des fractures*, p. 241.
(3) Mayor, *Nouveau système de déligation chirurg.* Paris, 1830, 3e édition, p. 306, planche 71.
(4) *Idem*, Paris, 1832, p. 110.

modifications sont rendus inutiles par tout ce que nous venons de dire sur la construction du genre d'appareil polydactile qui nous occupe : vous le saisirez d'ailleurs aisément en examinant le modèle que vous avez sous les yeux.

(Planche V.)

Fig. 10

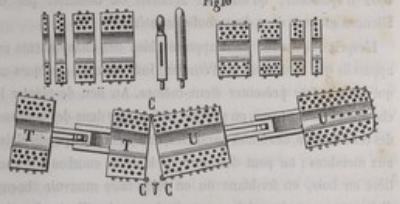


Figure 10. — Les planchettes brachiale TT, anti-brachiale UU, agrandies par des allonges, sont unies en CCC par deux charnières latérales. Quand on enlève la broche de l'une d'elles, l'appareil unique pour les deux membres se fléchit du côté opposé.

Fig. 11.

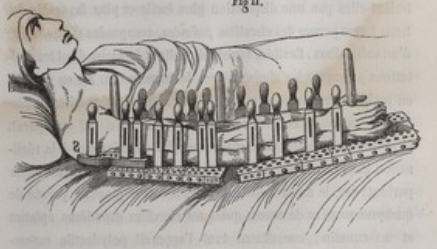


Figure 11. — Membre supérieur dans l'appareil avec son

béquillon terminal S. Ici encore, comme au membre inférieur, une simple planche trouée peut suffire.

J'ai trouvé superflu de représenter un modèle d'appareil polydactile pour certaines fractures de la tête et du tronc; simple châssis en bois troué de 1 mètre de long, de 0,75 de large, de 0,02 d'épaisseur, qu'on peut agrandir ou diminuer par des allonges glissant dans deux coulisses latérales.

L'esprit d'invention peut apporter bien des changements aux appareils que nous venons d'étudier; indiquons-en quelques-uns qui semblent se présenter d'eux-mêmes. Au lieu de planter les chevilles dans des trous, on peut les faire glisser dans des coulisses, des échancrures, des fentes parallèles, obliques ou perpendiculaires aux membres ; on peut découper en lanières courbes une gouttière en bois, en fer-blanc ou en tôle, faire mouvoir chacune d'elles avec une vis, qui traverserait chaque cheville, les fixer isolément, et, dans tous ces cas, arriver à suivre les contours du membre en l'embrassant aussi mollement et aussi exactement qu'on pourrait le faire, avec le *podomètre* des cordonniers. Et les chevilles à turion métallique de faibles dimensions, ne permettraient-elles pas une disposition plus facile et plus favorable des trous? Que penser des chevilles *palmées*, composées d'une feuille d'un métal doux, flexible, résistant, imitant la main, dont les digitations promptes à s'abaisser vers le membre ou à s'en écarter, en maintiendraient exactement la forme, en dessineraient fidèlement tous les contours? Poursuivant une idée qui me paraît féconde en applications nombreuses, j'ai dû m'arrêter à la réalisation la plus simple, la plus pratique, la plus facile à obtenir partout; car, je ne saurais trop le redire, une planche percée de quelques rangées de trous, quelques chevilles grossières aplaties et un coussin, constituent tout l'appareil polydactile *extemporané*, qu'on peut aisément se procurer partout.

2° *Application et mode d'action.* — Avant d'indiquer l'action spéciale de l'appareil à chevilles mobiles et de démontrer secondairement qu'il tient de tous les autres appareils, indiquons comment on l'applique aux membres inférieurs, où son importance est bien plus grande qu'aux membres supérieurs.

Sur les planchettes horizontales, munies d'un coussin qu'une toile cirée recouvre au besoin, placez le membre fracturé; sur ses deux côtés, relevez en gouttière la toile cirée, le coussin ; plantez dans les trous assez de chevilles pour maintenir le tout et laissez l'appareil dans l'extension ou placez-le dans la demi-flexion. Il n'est pas sans intérêt d'observer que le plateau qui supporte les planchettes inclinées, leur donne de la fixité, empêche leur renversement, que favorisent trop souvent des matelas inégaux et tient lieu de la planche que, depuis J.-L. Petit, la plupart des chirurgiens conseillent de placer entre les matelas. Et comme ce même plateau a plus d'épaisseur à l'extrémité digitale qu'à la racine du membre, il en résulte dans l'extension, pour le pied et la jambe, un certain degré d'élévation très profitable dans les inflammations de cette région.

Les chevilles mobiles sur l'échelle des trous, et disposées autour du membre, de manière à en suivre les contours, en reproduire la forme, font l'office des doigts, doigts inflexibles, sans doute, mais infatigables; doigts rigides, à la vérité, mais que le coussin d'enveloppe transforme en pelotes élastiques; doigts certainement insensibles, mais au devant desquels réside la sensibilité des parties malades, souvent exaltée par la lésion. Partout où la main de l'opérateur, modelant le membre, exerce une action efficace, une ou plusieurs chevilles ont leur raison d'être appliquées pour soutenir les tissus, les presser doucement, les comprimer s'il le faut; et, lorsque ces nuances d'une action unique devront s'exercer en avant ou en arrière du membre, on les obtiendra à l'aide

d'une bande, d'un lien coaptateur passant au-dessus ou au-dessous, et dont les extrémités engagées dans les mortaises des chevilles latérales, s'arrêteront aux clous de ceinture. Par la seule direction imprimée aux chevilles ou aux bandes complémentaires, le membre, dans son ensemble ou dans son extrémité libre seulement, pourra être porté dans l'adduction, dans l'abduction, en avant, en arrière. Il est facile, sans y insister plus longuement, de pressentir la multiplicité des ressources que sont susceptibles de fournir les éléments isolés que le chirurgien a à sa disposition. Nous aurons occasion d'y revenir.

Mais dans cette substitution des chevilles aux doigts, où il est parfois convenable d'isoler chaque élément, d'en réunir plusieurs, ou même de les disposer en séries continues, le point essentiel est de ne jamais excéder le degré de pression exercée par la main et les doigts de l'opérateur. Il faut même se rappeler toujours que cette compression, momentanément supportée avec facilité, peut bientôt devenir intolérable et de là l'obligation d'une application bien calculée et la nécessité d'une surveillance active, constante, plus facile ici qu'ailleurs, puisque les parties sont à découvert, les éléments de l'appareil isolés, puisqu'il suffit de reculer de quelques millimètres, une ou plusieurs chevilles, pour dissiper toute douleur et conjurer tout danger d'étranglement ; modification simple que le malade peut, pour ainsi dire, au gré de sa sensibilité, faire accomplir, dans l'absence du chirurgien, par la première personne venue, ou, à la rigueur, accomplir lui-même. Vous avez sans doute déjà saisi l'immense avantage dont je parle et qu'on est loin de retrouver dans ces appareils d'ensemble, bandages de Scultet, inamovibles, etc., qu'il faut défaire en totalité pour les modifier sur un seul point, où il est souvent difficile de déterminer le lieu qui souffre, où l'intervention du chirurgien est obligée, où il ne se décide à tout défaire qu'après de

dangereuses hésitations, où enfin son éloignement, son absence, et, il faut le dire, sa négligence même ont trop souvent amené d'irrémédiables accidents : la gangrène du membre et la nécessité de l'amputation.

Les chevilles, disposées autour du membre, peuvent figurer dans leur ensemble deux *attelles*, avec cet avantage capital, que brisées perpendiculairement à leur axe en fragments indépendants, elles se moulent sur les parties, en dessinent les contours ; et ces découpures, à la fois molles et résistantes, toujours substituées doucement aux doigts de l'opérateur, en retiennent le mode d'action et sous quelques rapports, l'intelligence.

Ces chevilles *digitales* sont tantôt à demeure, pour emprisonner à ciel ouvert le membre pendant toute la durée du traitement, tantôt mobiles, pour en suivre les changements d'état, tandis que la fracture reste fixe sur le plan solide qui la supporte. Sous ces points de vue divers, notre appareil ne vous rappelle-t-il pas avec certains avantages quelque chose des appareils *amovo-inamovibles?*

Il me semble que les formes variées de l'*hyponarthécie* s'y rencontrent également : Vous y trouvez déjà les *coussins*, le *double plan incliné*, la *planchette* fondamentale, qui, munie de ses chevilles, ressemble à une *gouttière*, à une *caisse;* fixez maintenant aux pitons de ceinture des sangles, des bandes, etc., préalablement engagées dans les mortaises des chevilles, ou une longue pièce de linge à lanières, et vous aurez deux espèces de *hamac;* appareils variés, que vous pourrez, à votre gré, mobiliser en les suspendant.

Les moyens de *contre-extension* et d'*extension* n'y sont pas accumulés avec moins de luxe. Sans insister sur le double plan incliné qui reçoit ici son application ordinaire dans ce double but, la contre-extension choisit son point d'appui et le prend :

1° soit à l'arcade du pubis, où vient arc-bouter la première cheville crurale interne convenablement matelassée; 2° soit à la mortaise du béquillon externe où s'engage et se réfléchit le lien qui embrasse l'anneau en daim de M. Baudens; 3° soit au gousset d'une ceinture propre à recevoir le béquillon lui-même; 4° soit enfin, au besoin, à l'aisselle, à l'aide d'un béquillon supplémentaire plus long.

L'extension, appliquée avec le secours des étriers, des bracelets connus, au pied, au-dessus des malléoles, au-dessous ou au-dessus du genou, s'obtient aisément en employant le treuil puissant de l'appareil, ou s'il faut peu de force, en enroulant les lacs sur une cheville-support, comme sur le treuil lui-même. D'un autre côté, au-dessus et au-dessous de la fracture, chaque cheville peut être convertie en un treuil isolé, où les mains du chirurgien seules ou aidées d'une tige de fer engagée dans la mortaise, enrouleront les lacs extenseurs et contre-extenseurs arrêtés enfin aux clous de ceinture. Remarquons que, en rejetant les lacs sur des chevilles placées en dehors du membre, comme sur des poulies de renvoi, on ménagera mieux les parties molles contre de dangereuses pressions dont il n'est possible de conjurer entièrement les effets, qu'en changeant fréquemment le point d'appui des forces extensives et contre-extensives. Faisons observer aussi que, tandis que se produit la double puissance de ces forces aux extrémités du membre, les chevilles interviennent, dans la continuité, partout où les doigts ont à régulariser la forme des parties.

Mais là ne s'arrêtent pas les ressources de notre appareil pour le développement des puissances continues : si, comme le pense M. Velpeau, les appareils inamovibles desséchés sont capables de maintenir la coaptation par la permanence d'une action extensive et contre-extensive disséminée sur toute la surface du membre; combien ne sommes-nous pas fondés à invoquer le bénéfice de

cette même action, puisque les chevilles de notre appareil reproduisent la configuration du membre en s'accommodant à ses reliefs, à ses anfractuosités, mieux que l'appareil amidonné ou dextriné qui se relâche, mieux que l'appareil en plâtre qui s'agrandit par le fait de la diminution du membre?

Enfin, pour ne rien omettre des applications dont notre appareil nous paraît susceptible, disons que des bandes, jetées en arc sur plusieurs points du membre et fixées aux clous de ceinture, le contiendront dans les contractions spasmodiques, dans les mouvements involontaires qui se produisent dans le sommeil surtout; et s'il fallait obtenir une immobilité complète, incessamment menacée par le délire, l'aliénation mentale, on devrait, après avoir fixé le tronc et les bras à l'aide du gilet de force, attacher au lit du malade l'appareil et le membre sain avec un ou plusieurs draps pliés en cravate, et maintenir le membre fracturé avec des bandes en cuir ou des liens coaptateurs.

De ce que nous venons de dire en dernier lieu, il résulte que l'appareil à chevilles mobiles a un mode d'action propre, spécial, dépendant de son élément nouveau; qu'il conserve de tous les autres appareils quelque chose tenant à ses éléments anciens; qu'il satisfait à des indications diverses.

3° Examinons maintenant comment cet appareil remplit les indications que le traitement des fractures réclame, et complétons ce que nous avons à vous dire sur la spécialité de son action.

Dans les fractures récentes et simples d'un ou des deux os de la jambe qu'un léger gonflement accompagne, notre appareil reçoit le membre dans une gouttière, le laisse à découvert, le maintient sans le comprimer à l'aide de ses chevilles, sortes de tuteurs qu'on approche ou qu'on éloigne à volonté. Il a, sur l'appareil à attelles, le plus simple de tous, l'avantage de serrer moins les parties, de ne jamais exposer à l'étranglement du membre, de

mieux porter le pied dans l'adduction ou l'abduction, de ne pas se relâcher, enfin, de ne jamais réclamer la nécessité de visiter l'appareil, de le réappliquer avec l'intervention obligée d'un aide au moins.

Dans les fractures simples du fémur, où le choix de l'appareil n'est plus indifférent, notre appareil polydactile a encore cet avantage que, se moulant très exactement sur le membre, il en rétablit mieux la *forme* et partant les *rapports*.

Les déplacements *angulaires*, selon l'*épaisseur*, selon la *circonférence* de l'os, sont combattus : par la résistance du plan postérieur et le plein d'une bande portant sur la face antérieure du membre; par les chevilles latérales; par la fixation du pied dans sa direction naturelle. Si on le veut, on pourra disposer ici des liens coaptateurs comme dans la *caisse* de M. Baudens, mais avec plus d'avantage encore, puisque chaque lien fixé à une seule cheville conservera un isolement, une indépendance précieuse qu'on ne trouve pas toujours dans l'appareil du chirurgien militaire, où ces liens, fixés à deux planchettes trouées, gardent toujours trop d'ensemble, car il faut les relâcher et les resserrer tous à la fois, quand il est nécessaire d'abaisser les planchettes. On pourrait, à la vérité, remédier à cet inconvénient en brisant les deux planches latérales en vingt planchettes munies chacune d'une charnière et de deux trous, et les ramener ainsi à la cinquième classe, c'est-à-dire aux appareils polydactiles dont elles constitueraient le troisième genre à *liens coaptateurs*. Mais, comme ce résultat s'obtient beaucoup plus aisément à l'aide de nos chevilles, nous aimons mieux nous contenter de l'indiquer au nombre des applications multiples de l'appareil à chevilles mobiles. D'un autre côté, l'air qui séjourne dans la *caisse* de M. Baudens exhale bientôt une odeur fétide qu'on ne retrouve pas dans celui qui circule librement à travers les chevilles.

Quant aux chevauchements, ils seront vaincus, comme dans les autres appareils, par les puissances extensives, contre-extensives, et la coaptation sera assurée par la permanence de ces forces et par la bonne configuration imprimée au membre à l'aide des chevilles et conservée aussi longtemps qu'il sera nécessaire.

Dans les cas particuliers de fractures très obliques de la jambe, où il est nécessaire d'agir longtemps sur le fragment supérieur du tibia, on pourra le comprimer dans tous les sens : latéralement, à l'aide des chevilles, des liens coaptateurs; d'avant en arrière, par des bandes solides, ou en employant le tourniquet de J.-L. Petit, comme M. Laugier l'a conseillé, comme je l'ai récemment fait moi-même en votre présence. Mais il ne faut pas oublier que ces compressions circonscrites ou disséminées ne sont efficaces qu'à la condition d'être légères ou de courte durée; autrement elles produisent l'œdème du membre, provoquent son inflammation et menacent l'intégrité des parties molles, où elles finissent par déterminer des excoriations, des escarres, des plaies profondes, surtout chez les malades atteints de fièvre! Dans ces conjonctures difficiles, où la pression forte et continue même du doigt du chirurgien ne serait pas sans danger, l'instrument à *pointe métallique* de M. Malgaigne, barbare en apparence, reçoit les plus heureuses applications. En ce moment, vous pouvez en voir un très bel exemple dans mes salles, et quelques-uns d'entre vous en ont suivi un second en ville; aussi, pour accommoder cet instrument utile à mon appareil dans le sens des idées qui ont présidé à sa confection, je l'ai criblé de trous, pourvu de turions, de mortaises, et ramené en quelque sorte à la condition d'une cheville. A ces modifications légères l'instrument à pointe métallique doit une fixité plus grande, une application plus simple, plus facile, mieux localisée : c'est ce dont vous pourrez juger par la comparaison des deux instruments.

(Planche VI.)

Fig 12.

Fig 13.

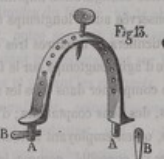


Fig 14

A la rainure de l'arc de l'instrument de M. Malgaigne, fig. 12, j'ai substitué 20 trous qu'on pourrait aisément réduire à 10, d'un seul côté. Ces trous, taraudés de 0,008 de diamètre, distants de 0,003, sont propres à recevoir une vis à oreille de 0,07 de long, percée d'un trou au centre de l'oreille pour l'assujettir au besoin, fig. 13.

J'ai supprimé l'écrou avec ses 2 petites vis, la boucle et le fort lien en soie de la figure 12.

A mon arc en fer coudé à angles vifs à ses extrémités, arc de 0,018 de largeur, de 0,006 d'épaisseur, de 0,20 de corde, de 0,14 de rayon, j'ai ajouté 2 turions à mortaise AA, fig. 13, qui, engagés de chaque côté du membre, dans des trous de la planchette jambière, y sont fixés au moyen des clavettes coniques BB, qui les traversent. Si des mouvements obscurs pouvaient exister encore au sommet de l'arc, ils seraient certainement empêchés par deux chevilles placées immédiatement en avant.

La figure 14 offre la dernière modification que j'ai fait subir à l'instrument de M. Malgaigne. Afin d'empêcher cette *cheville à pointe métallique* de tourner dans le trou de la planchette, trois ardillons de 0,002 ont été disposées en triangle à la face inférieure

de l'épaulement pour s'implanter dans le bois en dehors du turion. Cette légère innovation a reçu une sanction pratique favorable dans un cas de fracture compliquée de la jambe, où des plaies profondes, opposées au lieu d'implantation de la pointe, exigeaient des pansements minutieux sans nul obstacle aux manœuvres de la main. Il me semble que, réduite à cette simplicité, la cheville à pointe métallique devra toujours remplacer l'instrument de M. Malgaigne, qui ne cesse pas de conserver tout le mérite de l'invention première.

La cheville et l'arc à pointe métallique (fig. 14 et 13) fixés sur mon appareil à chevilles mobiles ou sur une de ses allonges seulement, sont susceptibles d'une heureuse application pour produire la compression partout où on voudra l'obtenir, sur les divers points d'un os, d'une tumeur, d'une artère, etc. Avec des dimensions, des courbures, des arrangements de trous, appropriés au volume, à la situation, à la direction des parties à comprimer telles qu'on les rencontre à la tête, au cou, au tronc, aux membres et à leurs divers segments, en émoussant, au besoin, la pointe de la vis, en la faisant porter d'aplomb sur des pelotes petites ou grandes, coniques ou carrées, rondes ou ovales, on aura un excellent moyen d'exercer une compression unique ou multiple, étendue ou restreinte, permanente ou alternante, directe ou indirecte, médiate ou immédiate, infatigable, bien précieuse pour maintenir les os, modérer le cours du sang, arrêter les hémorrhagies, oblitérer les vaisseaux, comprimer les tumeurs, les nerfs, etc., etc., sans constriction circulaire des parties et comme on le ferait avec les doigts.

Afin de ne pas multiplier, à l'infini, les tiges métalliques en les façonnant, pour ainsi dire, sur chaque partie du corps, j'ai cherché un modèle qui, par sa forme et ses dimensions, pût convenir à toutes les régions, et cette étude m'a conduit à déterminer les

conditions de structure d'un *compresseur général*. Je devrais peut-être me contenter, aujourd'hui, de vous montrer ce nouvel instrument, mais comme les appareils polydactiles, pour les fractures du tronc et des membres, sont un élément essentiel de ce compresseur qui s'applique aussi aux os, et qu'en définitive des considérations identiques se rattachent à la compression des parties dures et des parties molles, os, artères, veines, nerfs, tumeurs, etc., etc., je vais consacrer quelques instants à l'examen de l'agent compressif que vous avez sous les yeux, en prenant pour type son application la plus importante, la compression des artères.

Afin de donner, tout d'abord, à mon *compresseur élastique et gradué* son caractère propre, je vais essayer de lui affecter une place parmi les appareils du même genre déjà connus.

M. Broca, dans son admirable *Traité des anévrysmes*, indépendamment des appareils particuliers pour la compression *directe* ou *indirecte*, range ainsi les compresseurs, en se fondant, surtout, sur la *forme* et d'une manière accessoire sur l'*action*.

Compresseurs : à ressorts, à anneaux, à arcs, à tiges articulées.

En nous appuyant, de préférence, sur le mode d'action et accessoirement sur la forme, nous vous proposons cette classification :

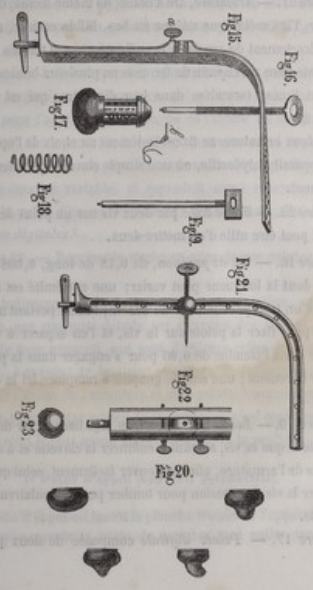
COMPRESSEURS.

I — Non élastiques
- amorphes : Garrot de Morel ; Tourniquet de J.-L. Petit ; Bandage de Genga, etc.
- à anneaux : Viricel, Hutton.
- à arc : Dupuytren.
- à tiges articulées : L'Estrange ; Bigg.

II — Élastiques
- Non gradués
  - Ressorts : Duval (de Brest), etc.
  - Tiges articulées : Carte ; Mathieu ; Broca.
- Gradué : J. Roux.

La planche suivante donne les principaux détails de mon compresseur.

(Planche VII.)



Compresseur élastique et gradué.

Figure 15. — *Armature*, tige métallique articulée, de 0,26 de haut, de 0,025 de large, de 0,005 d'épaisseur; criblée de deux rangées de trous de 0,008 de diamètre, trous alternes, taraudés; formée par l'assemblage de deux pièces qui se meuvent l'une sur l'autre et qu'immobilise la vis latérale *a*.

Figure 21. — *Armature*, arc à boule, de même forme, de même hauteur. Tige métallique unique en bas, bifide ensuite, recevant dans l'écartement de ses deux branches concaves taillées en lime et comme dans un chemin de fer, une ou plusieurs boules taillées aussi en limes, taraudées dans leur diamètre, qui est de 0,03 (figure 23).

Ces deux armatures se fixent isolément au choix de l'opérateur, sur l'appareil polydactile, où une simple clavette les retient invariablement.

Figure 22. — Boule fixée par deux vis sur un point de l'armature; il peut être utile d'en mettre deux.

Figure 16. — *Vis de pression*, de 0,18 de long, 0,008 de diamètre, dont la longueur peut varier; une extrémité est à oreille percée d'un trou pour la fixer au besoin, l'autre portant un tenon à crête pour fixer la pelote sur la vis, et l'en séparer à volonté, est lisse dans l'étendue de 0,06 pour s'engager dans la pelote, y tourner librement; une simple goupille *b* remplace ici la crête du tenon.

Figure 19. — *Indicateur à marteau*, tige lisse en fer de mêmes dimensions que la vis, servant à enfoncer la clavette et à explorer les trous de l'armature, afin de trouver facilement, celui que devra traverser la vis de pression pour tomber perpendiculairement sur la pelote.

Figure 17. — *Pelote digitale* composée de deux parties :

1° l'une supérieure en cuivre, de 0,06 de haut, de 0,05 de diamètre, sorte de boîte cylindrique graduée à l'extérieur sur deux colonnes, contenant un ressort à boudin que met en jeu la vis de pression après avoir traversé le trou de l'armature ou celui de la boule, et s'être engagée dans le sommet de la pelote. En tournant la vis, les deux plaques métalliques qui la composent en ce point s'écartent; chaque ligne de la graduation indique un poids de 0,500; l'échelle totale est de 7 kilogrammes, échelle bien suffisante dans la généralité des cas. En substituant à ce ressort celui figure 18, l'échelle s'élève jusqu'à 20 kilogrammes.

2° La partie inférieure, en liége recouvert d'une peau douce, se visse sur la partie supérieure, ce qui permet de la changer à volonté, pour l'approprier au volume de l'artère ou des parties à comprimer. Cette partie de la pelote, au moins aussi importante que la première, est en général convexe, ovale, aplatie en bas dans une étendue variable, et reproduit aussi exactement que possible la pulpe d'un ou de plusieurs doigts réunis; d'où le nom de *pelotes digitales!*

Figure 20. — Représente quelques-unes de ces pelotes seulement.

Il est indispensable de compléter cette description, par trop succincte, par quelques détails sur chacune des parties constituantes de mon appareil, qui sont d'ailleurs celles de tout compresseur, à savoir : 1° le point d'appui; 2° l'armature; 3° la pelote; 4° l'union de l'armature et de la pelote. Nous comparerons en même temps notre moyen de compression avec ceux qui jouissent du crédit le plus grand dans la science et la pratique.

1° Point d'appui (appareil polydactile).

Le point d'appui est tantôt la planche trouée de l'appareil polydactile qui supporte le corps, le membre tout entier, tantôt les

chevilles latérales opposées à la pression : ces points d'appui sont très étendus, fixes, invariables, immobilisant non seulement la région malade, mais encore le tronc et la tête, les membres étendus ou fléchis ; ils facilitent par un repos absolu partiel et général, la guérison de l'anévrysme. Ces points d'appui sont bien supérieurs, à mon avis, à ceux des *contre-pelotes*, des *attelles* et même des *gouttières* à contre-pression : en effet, les premières sont trop étroites et donnent peu de fixité à l'appareil ; d'où le dérangement facile de celui-ci, l'interruption de la compression à l'insu de tout le monde, la nécessité d'une main intelligente pour la réappliquer. Le principal inconvénient des contre-pelotes est que, lorsqu'on relâche la pression dans les manœuvres alternatives du procédé Belmas, le point d'appui se dérange, l'appareil tourne autour du membre, abandonne le vaisseau et le malade ne peut lui-même opérer de nouveau la pression. Dans mon compresseur, au contraire, en raison de la fixité du point d'appui, le malade peut manœuvrer lui-même l'appareil, relâcher ou serrer la compression, sans que la pelote se dérange et que le chirurgien soit obligé d'intervenir toujours. Les secondes, c'est-à-dire les attelles à contre-pression, comme celle de l'appareil de Brückner, sont totalement abandonnées de nos jours à cause de semblables imperfections. Les troisièmes, enfin, les gouttières, ont deux inconvénients majeurs : un des liens qui les maintiennent exerce une compression circulaire sur le membre ; la gouttière, en raison de sa surface arrondie, vacille, tourne sur le plan horizontal du lit et déplace ainsi les points de pression. Rien de tel dans notre compresseur : pas de constriction circulaire, pas la moindre compression forte des parties autre que celle de la pelote sur l'artère, pas de vacillation possible. En outre, aucune de ces gouttières n'immobilise tout le membre, le tronc, la tête, tandis que, dans notre appareil, cette immobilité est obtenue partout.

Cependant, comme dans quelques circonstances il sera utile de rendre le compresseur moins étendu et presque portatif, on obtiendra facilement ce résultat en prenant le point d'appui sur une planche trouée spéciale, ou sur les *allonges* mobiles et plus ou moins larges de l'appareil polydactile.

2e Armature { tige articulée à trous multiples, arc à boule.

L'armature de notre compresseur constitue, en définitive, un arc et a, sous ce rapport, beaucoup de simplicité, de légèreté et un maniement facile. Elle tient aussi des tiges articulées, mais on peut avancer, je crois, que si elle a les avantages des appareils à arc et à tiges articulées, elle n'en a pas les inconvénients. En effet, nous voyons que cette armature a une très grande fixité, que son mode d'articulation avec le point d'appui est mobile et que ce point d'appui a une échelle de trous qui permet de choisir le lieu de son implantation, en haut, en bas, de l'approcher ou de l'éloigner de la tête, du tronc, du membre. D'ailleurs, son turion articulateur étant arrondi en pivot et sa courbure convenablement calculée, celle-ci peut décrire un mouvement en arc de cercle dans des directions très variées. Les trous dont elle est percée, multiples, rapprochés, présentent des séries alternes tellement disposées que la vis qui les traverse peut toujours tomber sur l'artère perpendiculairement, du premier coup et sans ces tâtonnements inséparables de l'application des autres appareils. Ce dernier avantage est peut-être plus prononcé encore dans le modèle d'armatures à boules. A l'aide de ce mécanisme, notre compresseur est simple, peu encombrant, et, du moment qu'à ces conditions favorables il joint celle de la précision, il nous semble supérieur aux appareils anciens à arcs, à tiges articulées, qui ont moins de fixité, de précision, moins d'étendue des mouvements,

moins de simplicité. Pour bien constater ces faits, il suffira de jeter un coup d'œil sur la complication de vis que présente le meilleur de ces appareils, celui modifié par M. Broca : nous trouverons cinq vis. Une première pour fixer l'extrémité de l'armature dans la coulisse de la gouttière de contre-pression; une deuxième pour arrêter l'une sur l'autre les deux parties de la branche verticale; une troisième pour le jeu de la branche horizontale sur la verticale (vis de Signorini); une quatrième pour maintenir dans une étendue voulue la branche horizontale sur la verticale; une cinquième enfin pour empêcher les mouvements de la pelote sur l'extrémité de la vis. De la complication des vis, si l'on se reporte à celle du jeu de toutes ces pièces dont le mécanisme absorbe presque toute l'attention, et si l'on se rappelle les inconvénients déjà signalés de la vacillation de la gouttière, de la compression circulaire d'une courroie, on ne pourra s'empêcher de convenir que l'appareil qui nous occupe tranche sur ce dernier par la simplicité, la fixité, la sûreté de son application.

3° Pelotes digitales.

Nos pelotes, construites en vue d'imiter un ou plusieurs doigts appliqués à la compression d'un corps, sont *aplaties* au seul point de la pression, *convexes* partout ailleurs, *ovales, résistantes*, sans rigidité extrême, de *dimensions* variables, pour s'accommoder aux artères grandes, moyennes ou petites, aux os, aux nerfs, aux tumeurs diverses, etc. L'échelle de ces pelotes est toujours fondée sur l'imitation des doigts qui multiplient leur nombre, et partant augmentent le volume, pour comprimer les parties profondes, qui s'isolent et diminuent ainsi la dimension pour atteindre les parties placées à la superficie du corps, toujours avec toute la précision désirable, afin de n'agir que sur un point, sur l'artère

seulement, sans comprendre la veine, le nerf, les organes voisins, etc., dans la même compression. Mais ce qui distingue particulièrement nos pelotes, c'est l'élasticité, la graduation de la force, l'indépendance.

Elasticité. — Dans les appareils de Carte, de M. Mathieu, dans celui de M. le dr Broca, la force élastique est placée dans le voisinage de l'écrou, au-dessus de l'armature. Il résulte de la situation du cylindre en caoutchouc ou des deux ressorts à boudin de ces appareils, rejetés loin de la pelote, que l'élasticité transmise, pour ainsi dire, à travers un levier étendu, est moins fixe, moins directe, en quelque sorte perdue ou absorbée dans ce bras de levier : j'ai placé le ressort élastique dans la pelote elle-même, et certainement avec avantage : je suis trop peu versé dans la mécanique pour vous donner une démonstration technique de mon assertion, mais en jugeant cette question par sentiment et en comparant les très petites choses aux très grandes, il me semble que, si Archimède avait voulu remuer ou comprimer la terre, avec un ressort donné, annexé à son célèbre levier, il l'eût placé contre la résistance plutôt que vers un point éloigné sur l'immense bras de la puissance.

Graduation. — L'échelle tracée sur la pelote permet d'apprécier, très exactement, le poids qu'il faut à chaque artère pour la comprimer suffisamment. Vous m'avez vu dresser un tableau curieux de la quantité de pression que réclame chaque vaisseau pour l'interruption du cours du sang et déterminer une moyenne, prise sur un assez grand nombre d'individus. Cette appréciation, en apprenant à n'appliquer sur les tissus vivants que le degré de force rigoureusement indispensable, servira à la faire mieux supporter, à la rendre plus durable, et agrandira ainsi l'application de la compression comme méthode curative des anévrysmes, etc., etc. Et si on objectait : que l'expérimentation cli-

nique a justement appris à se défier des forces élastiques, de celle du caoutchouc, par exemple, il faudrait répondre : que le danger inhérent à ces ressorts n'a de réalité que lorsqu'ils produisent des compressions aveugles, dont il sera facile de conjurer les funestes effets, à présent que leur puissance, rigoureusement appréciée, exactement graduée enfin, pourra être dispensée avec mesure, et d'une manière alternative, sur tous les points d'une artère, d'une veine, d'un nerf, d'un membre, etc., etc.

Indépendance. — La faculté de fixer la pelote à l'appareil ou de l'en détacher à volonté, semble de peu d'intérêt et même sujette à inconvénients. Je dois avouer que j'attache une grande importance à cette indépendance, parce qu'elle déplace à son avantage les conditions d'application inhérentes aux autres appareils compressifs. Tandis que, dans les compresseurs anciens, la disposition de l'armature et la marche de la vis sont l'action souveraine et la pelote l'esclave, dans le compresseur nouveau c'est la pelote qui commande et la vis qui obéit. Dans cette substitution de l'attention pathologique à l'attention mécanique, dans cet intervertissement des rôles, c'est la pelote qui devient la partie intelligente puisqu'elle remplace immédiatement le doigt du chirurgien. Cette mutation opérée, il n'y a plus qu'à en assurer le maintien, et c'est là l'office de la vis de pression engagée dans le trou le plus direct de l'armature, celui que l'indicateur à marteau préalablement essayé a nettement et rapidement indiqué.

4° Union de l'armature et de la pelote.

La vis, ce trait d'union de l'armature et de la pelote, très accessible au malade lui-même, a des pas très rapprochés pour que la compression se fasse lentement, presque d'une manière insensible. La crête ou la goupille annexée au tenon s'engageant

sous la seconde plaque de la pelote, permet de la lier à l'appareil ou de l'en détacher pour la rendre indépendante. Elle tourne aisément, et, n'entraînant pas la pelote dans sa marche circulaire, elle n'expose pas la peau à des froissements douloureux, à une dangereuse torsion.

Application de l'instrument. — Avec un peu d'étude, il est facile de se servir du compresseur élastique et gradué sur tous les points du corps. Il faut pour cela : placer la tête ou le tronc, le membre ou le segment du membre sur l'un des appareils polydactiles, préalablement couvert d'un coussin approprié ; les immobiliser avec des chevilles qui les circonscrivent, pour ainsi dire ; chercher l'artère, appliquer un ou plusieurs doigts sur son trajet, en regard du point que l'on veut comprimer ; substituer, avec grand soin, la pelote aux doigts ; présenter l'armature, en général, perpendiculairement au trajet du vaisseau, vis-à-vis le point où doit se faire la compression, parfois au-dessus ou au-dessous ; fixer solidement l'armature au point d'appui ; chercher et découvrir, à l'aide de l'indicateur à marteau, le trou que la vis de pression devra traverser dans sa route directe ; la faire marcher jusqu'à la pelote, que l'opérateur tient fixe jusqu'au moment où la compression est achevée dans le degré et la direction voulus.

Les planches VIII et IX que vous avez sous les yeux, montrent l'instrument en place pour la compression du plus grand nombre des artères. Elles font voir : 1° l'appareil polydactile que je préfère, dans les diverses circonstances, comme point d'appui ; 2° les trous de l'armature que traverse la vis de pression ; 3° les différentes directions qu'il faut donner, selon les cas, aux trois parties de l'armature.

1° L'appareil polydactile, pour les solutions de continuité de la colonne vertébrale, s'étendant de la tête à la partie moyenne des cuisses, et qu'on pourrait prolonger jusqu'au delà des pieds, con-

(Planche VIII.)

stitue un point d'appui général pour les armatures, comme il serait un appareil général pour toutes les fractures. Convenablement percé dans sa partie moyenne pour recevoir le siége, il offre, sans

(Planche IX.)

contredit, le meilleur point d'appui pour la compression des artères du tronc, du cou, de la tête, de la racine des membres; vous voyez que c'est sur lui que s'implantent les armatures pour la compression des artères crurale, iliaques externe et primitive, l'aorte abdominale, la carotide, la temporale, la sous-clavière, l'axillaire sous la clavicule et dans le creux de l'aisselle. Sur les appareils polydactiles des membres, réduits à une simple planche trouée, se fixent les armatures destinées à comprimer les vaisseaux de ces deux membres. Ce n'est que dans des cas exceptionnels, lorsque, par exemple, la tumeur anévrysmale poplitée a produit la demi-flexion de la jambe, qu'il faudra choisir pour point d'appui l'appareil polydactile du membre inférieur (planche III), susceptible de se prêter à tous les degrés de flexion désirables, et de recevoir la tumeur dans son excavation centrale convenablement agrandie à cet effet. Vous remarquerez, enfin, que pour la compression de petites artères, comme la pédieuse, le point d'appui n'est plus qu'une allonge.

2° Ces mêmes planches VIII et IX indiquent que la vis de pression traverse : un des trous de la partie *verticale* de l'armature pour la compression des artères tibiale postérieure, crurale au troisième adducteur, brachiale portion supérieure et moyenne,

temporale; un de ceux de la partie *horizontale* pour atteindre l'aorte, la radiale, la cubitale, la brachiale extrémité inférieure, l'axillaire, la carotide; la partie *courbe*, enfin, pour arriver à la sous-clavière, et peut-être aussi à la carotide primitive, etc.

3° Quand la compression ne se fait pas dans une direction unique, et que, moins simple, elle résulte d'actions composées, ce qui arrive lorsqu'elle s'accomplit suivant des directions multiples, il est difficile de bien apprécier, sur de petites figures reproduisant des détails nombreux, la véritable situation des armatures qui est même incomplétement rendue; de là la nécessité d'une description spéciale, afin de mieux indiquer ces directions importantes. D'ailleurs, cette description a d'autant plus d'utilité, qu'elle s'adresse à la compression des trois principales artères, la crurale, l'iliaque externe, la sous-clavière.

En général, la direction de la portion verticale de l'armature devra former avec l'axe du corps des angles d'autant plus ouverts, que la compression se fera davantage de dedans en dehors; et la portion courbe-horizontale s'inclinera d'autant plus sur la portion verticale, que la compression s'exercera sur des incidences plus obliques.

Artère crurale. — Cette artère n'est bien comprimée sur le pubis que par une force à direction triple, savoir : de haut en bas, d'*avant en arrière*, de dedans en dehors. Or, pour atteindre ce résultat, avec l'armature à trous multiples, il faut : 1° l'implanter en dehors du membre, près de sa face externe, à 20 centimètres au-dessous de l'épine iliaque antéro-supérieure; 2° la tourner de façon que sa portion verticale fasse avec l'axe du corps un angle de 45° environ; 3° que sa portion courbe-horizontale, inclinée à peu près à la moitié, regarde par sa concavité l'avant-bras étendu du côté comprimé, et par sa convexité la cuisse du membre opposé. L'indicateur à marteau trouvera alors sans peine,

sur la portion horizontale, le trou que la vis devra traverser pour tomber sur la pelote et comprimer l'artère dans la direction indiquée.

Artère iliaque externe. — Il faut aussi la comprimer dans une triple direction : de haut en bas, d'*arrière en avant*, de dedans en dehors. Dans ce but, plantez l'armature en sens inverse de la situation donnée pour l'artère crurale, c'est-à-dire en dehors du tronc, au-dessous des fausses côtes, à 8 centimètres au-dessus de l'épine iliaque antéro-supérieure, la concavité de la portion courbe-horizontale regardant la cuisse du côté comprimé et sa convexité le membre supérieur du côté opposé.

Artère sous-clavière. — Deux directions — d'arrière en avant, de dehors en dedans. Plantez l'armature à peu de distance du cou; inclinez faiblement vers l'épaule du côté comprimé la convexité de sa portion courbe-horizontale, et à travers un des trous de la courbure, la vis tombera sur la pelote et le vaisseau, entre la clavicule et la première côte. Il est essentiel d'élever les deux épaules et le cou avec un coussin épais et d'assujettir le malade à l'aide d'une cheville ronde matelassée placée sous chaque aisselle.

Il est inutile de nous arrêter sur les règles générales qui devront diriger dans l'application de l'armature à boule; quelques instants d'études près du malade suffiront pour apprendre tout ce qu'il faut savoir pour s'en servir avec une extrême précision. Dans les manœuvres de la compression alternante il faut deux armatures; deux modèles différents ne sont pas indispensables, mais j'attache une certaine importance pratique au choix que j'ai fait, et que, sans aucun doute, on cherchera bientôt à modifier.

L'application du compresseur élastique et gradué, exige peut-être plus d'étude que les autres : à cause des faibles dimensions des pelotes digitales il faut bien connaître la direction, les rapports des vaisseaux; leur convexité réclame la juste appréciation de la configuration des surfaces osseuses dans les cas, par exem-

ple, où l'action compressive s'exerce entre trois corps sphéroïdes, la pelote, le vaisseau, le pubis, comme pour les artères crurale, iliaque externe, etc. Mais nul ne songera à considérer, comme une difficulté, une étude, au fond plus simple que celle des procédés opératoires les moins compliqués et qui, dans tous les cas, ne pourra jamais tourner qu'à l'avantage de la méthode elle-même.

Dans les planches que vous examinez, j'aurais désiré que chaque pelote comprimant chaque artère indiquât la moyenne du poids qu'exige la suspension complète du cours du sang dans chacune d'elles, mais c'était évidemment trop exiger.

L'observation attentive de la compression graduée, intéressante sous tous les rapports, conduit à la rendre plus supportable, en n'appliquant jamais en excès la force de pression. Son étude apprend à apprécier la force exacte qu'il faut pour aplatir les parties molles qui recouvrent un vaisseau, celle nécessaire, à partir du moment où la pelote commence son action sur l'artère jusqu'à celui où son calibre est entièrement effacé. Cette gradation lente, peut être appréciée sur l'échelle de la pelote; mais vous vous rappelez que je vous ai fait assister au spectacle curieux de la marche d'une aiguille et d'une bulle d'air marquant sur un cadran et un tube de verre gradué, le début, l'agrandissement, l'apogée, le déclin, la cessation des amplitudes oscillatoires imprimés à l'armature à trous multiples, par la réaction des parois artérielles en rapport avec les degrés divers de la compression.

J'ai souvent comprimé sur un assez grand nombre d'hommes atteints d'affections chirurgicales légères, non seulement toutes les artères représentées dans les figures que vous parcourez, mais encore la plupart des points intermédiaires. Dans plusieurs circonstances, j'ai laissé, pendant vingt-quatre heures, la compression s'exercer presque complète et partant au delà du degré voulu pour la compression indirecte, sur la crurale et l'iliaque externe; je

puis déclarer qu'elle a été bien supportée, sans tuméfaction, sans rougeur du membre, avec un fourmillement à peine sensible, un peu de rougeur et de douleur sur la peau que la pelote pressait. J'avais, à dessein, négligé de garantir le tégument contre les effets de la pression, par les précautions employées en pareil cas, et les sujets de l'expérimentation (à part la contrainte que leur imposait une opération sans résultat utile pour eux), affirmaient qu'ils auraient pu supporter plus longtemps encore l'application d'un appareil que les exigences du traitement des anévrysmes ne commandent jamais de laisser si longtemps sur le même point et à un degré de pression aussi considérable!

Pour la compression *multiple*, *alternante*, on engage dans la même armature plusieurs vis tombant sur plusieurs pelotes, comme à l'avant-bras, par exemple, quand on veut arrêter ou ralentir le cours du sang en même temps dans les artères radiale et cubitale. Ou bien on place plusieurs armatures échelonnées sur toute l'étendue du vaisseau et dans sa direction. Ces appareils, assez déliés et peu encombrants, peuvent se placer côte à côte, de telle sorte que la nouvelle compression à faire peut être très rapprochée du lieu où se trouve celle qui existe déjà. On peut ainsi se ménager sur toute l'étendue du vaisseau, et presque de centimètre en centimètre des points nombreux de compression. Faisons remarquer que la compression alternante peut être produite même sur les tissus que recouvre une seule pelote ovale, à l'aide de mouvements légers de rotation imprimés à la boule ou à la courbure de l'armature et à la vis, de manière à reproduire, sur les points comprimés par la pelote, ce qui se passe, dans la station assise, sur la tubérosité de l'ischion sur laquelle le tronc s'incline par degrés pour laisser reposer les tissus endoloris par une pression trop forte ou trop longtemps continuée; action intermittente dont la pulpe des doigts, disposés en longue pelote ovale, nous

offre une image plus fidèle encore, lorsqu'appliqués en ligne droite, sur un même corps, ils en pressent alternativement tous les points en se balançant, pour ainsi dire, à sa surface, ou en se passant successivement de l'un à l'autre la force compressive.

Ainsi, j'ai, sur l'homme malade, comprimé avec succès des fractures rebelles à tous les autres moyens; sur l'homme sain, j'ai appliqué mon compresseur, sur un très grand nombre d'artères, avec facilité et des résultats complets. J'ai constaté que son action pouvait s'étendre non seulement aux artères de la tête, du cou, des membres, mais encore aux iliaques externe, primitive, et jusque sur l'aorte abdominale. Dans les cas désespérés d'anévrysmes de l'aorte, des iliaques primitives, interne ou externe, quand la chirurgie reste désarmée, nous pensons que, non seulement on pourra comprimer l'aorte, y maîtriser le cours du sang, le ralentir ou le suspendre momentanément dans tout son calibre, mais encore qu'il ne sera pas impossible d'obtenir ce ralentissement, cette suspension sur une de ses parties latérales seulement, à l'aide d'une pelote convenable, sorte de *vanne* jetée sur la moitié terminale de ce volumineux vaisseau, et laissant sans trop d'entraves le courant sanguin continuer dans le côté opposé; ressource extrême, sans doute, mais non impraticable comme la ligature! Audacieuse conception que la théorie justifie et dont la réalisation pratique, peut-être assez prochaine, serait une des belles conquêtes de l'art dont elle reculerait les limites.

Dans l'état physiologique, les phénomènes qui accompagnent la compression de l'aorte dans l'abdomen, sont trop graves pour permettre au médecin prudent d'insister: (douleur spéciale sur le trajet de l'aorte jusqu'au cœur, malaise, anxiété, pâleur, sueur abondante, bientôt froide). Dans l'état pathologique, où le but justifie davantage les moyens, on comprime depuis assez longtemps l'aorte dans les hémorrhagies utérines; ne pourra-t-on pas

la comprimer aussi pour d'autres pertes de sang, pour des anévrysmes cachés dans l'abdomen, et dans les cas où la mort imminente, comme dans l'anesthésie toxique, par exemple, réclame le réveil du cœur, que le refoulement de son excitant naturel pourra peut-être provoquer?

On peut entrevoir que notre compresseur, modifié dans une des extrémités de la vis, et exerçant la compression de dedans en dehors, ou une traction bien calculée, pourra servir: à comprimer certaines artères, la mammaire interne, l'intercostale, à soulever des portions d'os enfoncées, dans les fractures du crâne, de la poitrine, avec plaies, à extraire des corps étrangers, etc.

Mais le perfectionnement le plus digne d'intérêt peut-être, et qui a reçu un commencement de réalisation devant vous, c'est l'adjonction à l'extrémité de l'armature du *cadran*, ou celui du *niveau* à bulle d'air gradué, susceptible de faire apprécier, avec la plus grande exactitude, comme je vous l'ai dit déjà, les oscillations qu'imprime à l'appareil la réaction des tuniques artérielles que la pelote étreint; amplitudes oscillatoires qui révéleront au juste le *moment* de la compression indirecte. Le diagnostic des affections du cœur et des artères, des tumeurs, celui des maladies de toutes les parties où des mouvemens se passent, ne pourra-t-il pas s'aider d'un instrument qui permettra de voir ce que l'oreille fait entendre, ce que la main fait toucher?

Mais il est temps de nous arrêter dans l'énoncé de choses plus pressenties que démontrées; indications simples que comporte l'enseignement de la pathologie générale, et que n'accepterait pas celui plus rigoureux de la clinique.

L'observation n'a pas sanctionné encore les avantages que nous attachons à notre compresseur, même dans les plaies artérielles récentes, dans les anévrysmes, partout où le doigt qui intervient a besoin d'être suppléé; attendons donc que l'expérience ait

parlé, et revenons à la réalité des faits en résumant les traits qui forment le caractère du compresseur élastique et gradué.

1° La spécialité et l'étendue du point d'appui.

2° La fixité de l'armature et la disposition de sa courbure.

3° La pelote digitale, élastique, graduée, indépendante.

4° La certitude de connaître le poids compressif, de mieux le faire supporter aux tissus, d'obtenir une compression continue.

5° La diversité des mouvements utiles sur tous les points de l'armature.

6° La simplicité plus grande de sa construction; la facilité, la sûreté de son application; la généralité des services que peut rendre un seul appareil pour toutes les compressions.

7° La faculté d'apprécier, par une mesure rigoureuse, le degré de réaction des artères.

8° L'avantage réel de le faire fabriquer partout, et celui plus modeste, il est vrai, mais non moins réel, d'être moins coûteux.

Aujourd'hui, que se multiplient, en divers lieux, les succès du traitement des anévrysmes par la compression intermittente opérée à l'aide des doigts de plusieurs chirurgiens agissant successivement sur un même malade, il pourra sembler à quelques personnes, que je n'ai travaillé que pour une époque déjà passée, mon compresseur étant arrivé trop tard. Cette opinion, je l'espère, ne sera pas partagée par tout le monde. Dans mes études sur l'important sujet qui nous occupe, j'ai regardé dans le passé, le présent et l'avenir : dans le passé, pour apprécier l'insuffisance de tous les moyens de compression alternante; dans le présent, pour reconnaître la supériorité des doigts; dans l'avenir, pour substituer à ces admirables organes quelque chose de mieux, un instrument mécanique très imparfait sans doute, le compresseur élastique et gradué! C'est que, dans la pratique de la chirurgie, les instruments l'emportent sur les doigts si distraits, si fatigables, si

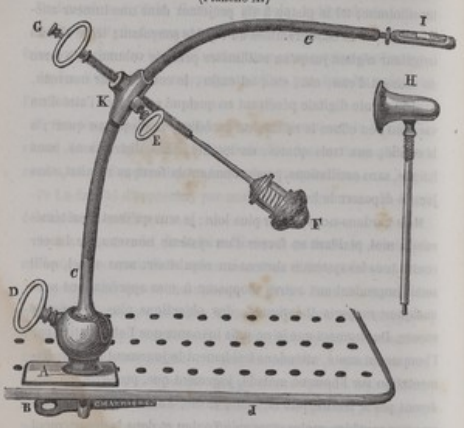
mobiles, si dépourvus de fixité certaine et graduée, toutes les fois qu'il faut exercer sur les parties vivantes, une action précise, durable, mesurée, presque mathématique : tels la sonde cannelée dirigeant le bistouri, et le conducteur de Fanestoch guidant le tonsillotome; tel le piston à vis projetant dans une tumeur anévrysmale les 10 centigrammes du liquide coagulant; tel le siphon irrigateur réglant jusqu'au millimètre près, le volume et la force du courant d'eau, etc., etc.; tel enfin, le compresseur nouveau, dont la pelote digitale pénétrant en quelque sorte dans l'aire d'un vaisseau, en efface le calibre ou en éclipse le disque au quart, à la moitié, aux trois quarts, en totalité, sans distractions, sans fatigue, sans oscillations, proportionnant la force au résultat, sans jamais dépasser le but!

Mais gardons-nous d'aller plus loin; je sens qu'il est aussi téméraire à moi, plaidant en faveur d'un système nouveau, de lancer contre tous les systèmes anciens un réquisitoire sans appel, qu'il serait imprudent aux autres d'opposer à mes appréciations sous quelques rapports théoriques, des objections plus théoriques encore. Du moment que je ne puis invoquer que l'observation sur l'homme en santé, attendons froidement le jugement de l'expérimentation sur l'homme malade, jugement que, peut-être, ne tarderont pas à rendre, loin de notre École, aux lieux où les anévrysmes sont bien moins rares qu'à Toulon et dans le département du Var, les chirurgiens les plus habiles, jaloux de substituer, à la ligature périlleuse et sanglante, une opération innocente et sans effusion de sang, la compression graduée.

Les figures de mes appareils et les dimensions que j'en ai données, suffiront pour les faire confectionner partout. J'ai d'ailleurs déposé chez M. Charrière, à Paris, les divers modèles qui ont été exécutés avec beaucoup d'habileté, à Toulon, par MM. Aubert, bandagiste, Authier, mécanicien, Berenguier, tourneur, Malacrida, opticien, Toucas, dessinateur.

Je possède déjà un modèle de mon compresseur auquel M. Charrière a apporté quelques différences de fabrication qu'il décrit lui-même comme suit :

(Planche X.)



« A, plaque ou base du compresseur fixé sur la planche au » moyen de la clavette B. — CC, tige courbe trempée en ressort » et taillée en lime; cette tige s'incline dans tous les sens au moyen » de la genouillère renfermée dans sa boîte sphérique, et que l'on » arrête, fixe dans toutes les positions au moyen de la forte vis à » pointe D. — F, une des diverses pelotes, porte-pelotes avec ressort en spirale, et la vis représentée en action dans les planches » et figures déjà indiquées des appareils de M. J. Roux. — E, vis » de pression pour fixer à la place et au degré d'inclinaison de » droite à gauche ou à coulisse d'avant en arrière dans les divers

» points, la coulisse K, dans laquelle se monte la grande vis » porte-pelotes. — I, niveau d'eau qui est vissé au bout de la tige. » — H, marteau destiné à enfoncer la clavette; il est muni d'une » vis-épreuve déjà indiquée dans la planche de l'appareil de M. J. » Roux, mis en action. »

Je reviendrai, Messieurs, dans d'autres entretiens, sur tous les points qui se rattachent au compresseur qui vient de nous occuper. Je me suis laissé aller à vous les indiquer, sans doute, un peu trop longuement, sans cependant sortir entièrement de mon sujet, car, vous le voyez, de l'étude d'un appareil polydactile à fractures, nous sommes arrivés, sans tarnsition brusque, à l'examen d'un appareil de compression générale, au compresseur élastique et gradué; c'est que ces deux choses, loin de s'exclure, se complètent; *contenir, comprimer*, n'est-ce pas la formule des conditions essentielles des deux genres d'appareils qui, dans le système que j'expose, marchent parallèlement et se rendent de mutuels services, en s'empruntant, pour des résultats souvent différents, quelques-uns de leurs éléments? Et pour obtenir le but que j'ambitionne d'atteindre par ces deux appareils, leurs éléments ne doivent-ils pas s'y rencontrer, s'il est possible, avec la perfection de l'appareil type par excellence, le *doigt?* De là, je le répète encore, le mot *polydactile*, affecté à l'appareil à fracture et celui de *compresseur digital*, que je n'eusse pas manqué de donner à mon instrument si je n'avais craint la confusion, la *compression digitale* exercée avec les doigts mêmes étant déjà accréditée dans le langage scientifique et consacrée dans les livres. De là, enfin, les noms de *chevilles*, de *pelotes digitales*. D'un autre côté, quand l'esprit est dominé par une idée féconde, il est dans sa nature de l'agrandir par l'induction, de la généraliser dans l'application; et de même que vous avez vu la compression de l'artère la plus petite nous conduire jusqu'à celle de la plus grosse, de même l'appareil polydactile à chevilles mobiles édifié d'abord pour les fractures de tous

les segments des membres, nous a paru applicable à certains cas de fracture du crâne, de la face, de la clavicule, des côtes et surtout aux fractures si délicates et encore sans traitement efficace de la colonne vertébrale, qu'il faut considérer ici comme un seul os. Mais ce sont là des applications que je ne signale qu'en passant et sur lesquelles je n'insisterai bien qu'à mesure que des faits cliniques viendront justifier l'actualité et l'opportunité de nouvelles communications.

Nous avons hâte de revenir aux fractures et d'arriver aux plus compliquées qui font encore le désespoir de l'art, car, s'il est vrai que dans les fractures simples tous les appareils réussissent, il n'est pas moins exact que tous échouent ou sont insuffisants dans les fractures compliquées, mais, selon nous, à des degrés divers. En effet, dans les fractures avec esquilles adhérentes, bouts d'os chevauchants, plaies des parties molles étendues, profondes, avec hémorrhagie, délabrements articulaires même, lorsque l'amputation n'est pas jugée nécessaire ou qu'elle est repoussée, que voulez-vous demander tout d'abord aux appareils à attelles, inamovibles, à extension continue? Rien, sans doute, car, dans ce moment, ils ajouteraient d'inévitables périls à ceux qui menacent les malheureux blessés. Seuls, les appareils hyponarthéciques seront utiles : supports inoffensifs, ils satisferont à la première indication de toute fracture, l'*immobilité*. Dans cette classe d'appareils, la planchette de Mayor, le double plan incliné d'A. Cooper, la caisse de M. Baudens, l'appareil analogue de M. D. Arnaud, chirurgien de 1re classe de la marine, reçoivent ici de fréquentes et heureuses applications, non seulement comme support efficace, mais encore par les ressources nombreuses qu'ils mettent à la disposition du chirurgien. Avec ces appareils, recommandables par les noms de leurs auteurs et les résultats cliniques, permettez-moi de comparer l'appareil polydactile à chevilles mobiles.

Étendu sur les planchettes garnies du coussin et de la toile cirée,

le membre fracassé est exposé à l'air, à la lumière, aux regards, et trouve désormais tous les moyens d'y rester jusqu'à l'entière guérison, sans qu'il soit nécessaire de changer, de défaire, de renouveler, de réappliquer l'appareil. Mais voici ce qui commence à distinguer l'appareil polydactile : loin du délabrement des parties, ou près de ses limites, des chevilles maintiennent le membre et le pied, non à la manière d'une *cravate* circulaire qui comprime, d'un *lien coaptateur* demi-circulaire qui étreint, mais comme un *tuteur* qui soutient, différence insignifiante en apparence, mais capitale quand il importe tant d'écarter les obstacles qui menacent la circulation déjà si languissante dans les parties dilacérées. C'est ainsi que, sans compression aucune et sans nul danger d'étranglement, le membre reçoit de notre appareil, avec l'*immobilité* complète, sa *direction* normale.

Rien ne saurait y entraver les pansements, si compliqués qu'ils soient; en ne plantant pas de chevilles en regard des plaies, des serres-fines, des sutures entortillées, etc., on évitera toute compression nuisible. A travers ces ouvertures ou ces fenêtres, bien plus faciles à ouvrir et à fermer que celles des appareils inamovibles, et dont à son gré le chirurgien peut augmenter le nombre, les dimensions, sans secousse même légère, il sera on ne peut plus aisé de surveiller, de visiter le pansement, d'en changer les pièces, de diriger le pus, de l'absterger sur la plaie et sur la toile cirée, d'arrêter les hémorrhagies, de pratiquer des incisions, d'enlever les esquilles, etc., d'accomplir enfin tout ce qu'exige le traitement délicat des fractures les plus graves.

A mesure que l'inflammation s'affaiblit, que le gonflement diminue, et dès que les doigts peuvent comprimer, soulever, rapprocher sans danger divers points du membre, on les remplace par une ou deux chevilles, avec l'attention constante de *soutenir* les parties sans les *comprimer*. Au plus léger indice de

douleur, on les reculera pour les avancer encore; on travaillera ainsi à rapprocher les tissus écartés en talonnant, pour ainsi dire, la nature dans sa marche réparatrice, afin de façonner le membre et d'arriver le plus promptement, mais par degrés, à lui rendre sa *forme*. J'insiste toujours sur ce dernier résultat à cause de ses conséquences, car, avec la *forme*, on rend ordinairement au membre ses *rapports*.

Pour achever cette œuvre toujours lente lorsque après une fracture compliquée on n'a pu restituer immédiatement au membre sa direction, sa forme et ses rapports, il faut lui rendre ses *dimensions*, sa longueur exacte, en triomphant du chevauchement par l'extension continue, l'application des pointes métalliques, le relâchement des muscles sur lequel M. le docteur Loreau a si justement insisté. (*Archives générales de médecine*, 1846, page 249.) Vous avez apprécié, parce que nous vous avons déjà dit, toutes les ressources de l'appareil polydactile pour éviter les excoriations, les escarres, en variant les positions, les points d'appui de l'extension et de la contre-extension, faculté précieuse de laquelle dépend tout le succès de ce mode de traitement.

Enfin, pour prévenir les raideurs articulaires et les douleurs consécutives qu'elles provoquent trop souvent, pour prévenir l'ankylose, et même pour soulager seulement les malades par des degrés divers de flexion du membre, ce même appareil s'incline, s'étend au gré du médecin, et, pour ainsi dire, au caprice du patient.

Depuis dix ans, à Cherbourg d'abord, à Toulon ensuite, et en ce moment sous vos yeux, il m'a été permis de donner la solution du problème depuis longtemps soulevé pour le traitement des fractures les plus graves; c'est-à-dire, de les guérir à l'aide d'un appareil, qui, laissant le membre à découvert, immobile, successivement étendu ou fléchi, lui rend, sans secousse et sans souf-

frances étrangères à la lésion elle-même, sa direction, sa forme et ses rapports, ses dimensions; assure la facilité des pansements et des opérations consécutives, sans changement, sans levée de l'appareil dont la première application, à peine modifiée ou complétée, dure jusqu'à l'entière consolidation. Et ces manœuvres peuvent s'accomplir avec une sécurité telle, qu'il m'est arrivé en ville de confier, sans inconvénient, à des personnes étrangères à l'art, les pansements délicats qui suivaient ma visite du matin, et qu'il m'était très facile de faire sans le secours d'aucun aide.

Ces résultats heureux sur lesquels j'appelle toute votre attention, quelques appareils hyponarthéciques permettent de les atteindre aussi. Mayor les revendique avec chaleur pour sa planchette, ses gouttières, etc. Mais je crois qu'on ne les obtient ni aussi facilement, ni sans quelques inconvénients et même quelques dangers; les cravates, les liens coaptateurs circulaires se relâchent, se salissent; il faut les resserrer, les changer; il est parfois indispensable d'abaisser les parois des *caisses*, d'en renouveler le remplissage: manœuvres toujours accompagnées de compression, de secousse, de douleurs, de mouvements, et partant de changements au moins momentanés, dans la direction du membre. Il est juste de dire, cependant, que les appareils de Mayor, ceux de MM. Baudens, Arnaud, Gaillard, etc., ont servi à obtenir de beaux succès qui se multiplieront entre des mains habiles. Je ne vous conseille donc pas mon appareil d'une manière absolue et à l'exclusion de tous les autres; si j'insiste autant sur ses qualités, c'est parce qu'il n'est pas connu, et que, dans ma pratique, vous vous apercevez qu'il est l'objet d'une préférence marquée. Je ne frappe de proscription, dans le traitement des fractures les plus graves, que les appareils inamovibles, c'est chose généralement convenue, et le bandage de Scultet avec ses compresses tendues, ses plans de bandelettes constrictives,

ses coussins trop chauds, ses attelles inflexibles, ses liens trop lâches ou trop serrés, sa bande plantaire insuffisante, sa tibiale masquant encore le membre et déguisant fréquemment un pansement mal fait; appareil trop souvent malheureux, qu'un grand nombre de chirurgiens s'obstine à conserver, malgré l'incessante menace de l'étranglement, les longueurs des pansements, la nécessité d'avoir des aides, les mouvements, les douleurs inséparables de son application, malgré l'obligation de le visiter sans cesse, de le renouveler, de le défaire, de le réappliquer au moins une fois par jour, et en dépit des insuccès de la pratique et des enseignements de la raison! Cette proscription, dans les cas que j'ai spécifiés, ne la perdez pas de vue, vous, Messieurs, qui pratiquez la chirurgie à bord des vaisseaux, sur les champs de bataille, et qui devez votre préférence aux appareils qui, permettant une surveillance facile, sont les plus simples, les plus rapides dans leurs applications, les plus sûrs dans leurs résultats.

Si je ne m'abuse, et, si par un sentiment presque naturel, je n'exagère pas les avantages de mon nouvel appareil et la signification des résultats que j'en ai obtenus, je crois qu'il pourra être de quelque utilité à bord des vaisseaux, où les conditions d'immobilité sont si difficiles à obtenir, où il sera toujours facile de le faire confectionner. J'espère même que la chirurgie navale pourra multiplier ses applications et en retirer encore de bons effets dans les fractures de la rotule, du grand trochanter, dans les phlegmons diffus, les arthrites aiguës et chroniques, dans les plaies des articulations, les entorses, dans les raideurs des jointures, les ankyloses commençantes, dans tous les cas, enfin, où il faudra aux membres inférieurs de l'immobilité, ou bien vaincre les raideurs articulaires par des mouvements gradués, faire des pansements compliqués, recourir aux irrigations continues, etc., etc.

A bord des bâtiments à voiles et à vapeur, il a toujours été

très difficile, quand les mouvements qui les agitent en tous sens, sont violents, d'empêcher leur retentissement dans les membres fracturés. Dans les circonstances ordinaires, il suffira cependant de placer le malade et mon appareil dans un *cadre en toile*, dont les parois latérales à transfilage pourront être abaissées ou relevées à volonté, de le suspendre au centre du navire, au niveau de la flottaison, parallèlement à la quille. Alors, les mouvements de roulis deviendront nuls et ceux de tangage seront singulièrement affaiblis par l'emploi de deux crocs à double effet, garnis de caoutchouc vulcanisé, et rapprochés l'un de l'autre. Mais les mouvements vibratoires qui retentissent partout et que provoquent les commotions du choc des lames, de la chute de l'ancre, de la déflagration de la poudre, de la trépidation des machines à vapeur, peuvent encore arriver jusqu'aux surfaces fracturées et les ébranler. J'ai fait connaître ailleurs (fracture du fémur, *Revue médico-chirurgicale*, 1849, page 87) le fait intéressant d'un matelot du vaisseau le *Montébello*, atteint de fracture sus-malléolaire compliquée d'angioleucite, qui éprouvait, au mouillage même, par les simples salves d'artillerie, de telles douleurs au point blessé que pour faire cesser ces souffrances intolérables, je n'avais trouvé d'autre moyen que de l'isoler des surfaces vibrantes du vaisseau en dépendant son cadre et en le faisant soutenir à chaque angle par quatre matelots dont le corps souple et les bras élastiques décomposaient et absorbaient le mouvement. Ne pourrait-on pas obtenir plus simplement ce résultat par la suspension du cadre à un seul croc à effet multiple et garni de caoutchouc épais?

L'appareil polydactile reçoit aux membres supérieurs une application plus facile toujours fondée sur les principes que nous venons d'indiquer pour les membres inférieurs. Nous nous exposerions à des redites si nous y insistions d'avantage. Du reste, à

défaut d'une description détaillée qui, aujourd'hui, m'entraînerait trop loin, vous pourrez compléter ma pensée par l'examen attentif du modèle que je laisse entre vos mains. (Pl. V.)

Sur le point de terminer cette séance consacrée à l'étude d'appareils mécaniques, je ne voudrais pas, Messieurs, matérialiser dans votre esprit le traitement des fractures des membres; ce qui doit prévaloir ici, c'est la connaissance des indications à remplir, l'application des moyens n'étant jamais que secondaire: au-dessus des appareils domine le génie du chirurgien qui les applique, comme au-dessus de la main de l'homme réside l'intelligence qui la met en exercice. Mais il me faut aussi vous prémunir contre la dangereuse exagération de quelques chirurgiens qui n'accordent aux appareils qu'une importance par trop insignifiante; les appareils sont aux indications des fractures ce que les instruments de musique sont à l'harmonie, et certainement l'instrument à une seule corde et celui qui en possède plusieurs sont loin d'être sur la même ligne pour la perfection et la multiplicité des accords.

Afin de joindre l'exemple au précepte ou, si vous l'aimez mieux, la pratique à la théorie, je vais, en terminant cette leçon, vous rappeler, le plus rapidement possible, les observations de quelques-uns des malades que vous avez observés à ma clinique de l'hôpital, à celle de la ville, dont les fractures ont été traitées à l'aide des appareils qui nous occupent en ce moment.

Clinique de l'hôpital du Bagne.

Fracture simple de la jambe droite. — Appareil polydactile à chevilles mobiles, au début. — Bandage dextriné pour achever la guérison.

Observation I. — H... Louis, âgé de 27 ans, d'une constitution robuste, au bagne depuis un an, était occupé, le 6 mars 1858, à porter un

madrier, de concert avec trois autres condamnés, lorsque ceux-ci ayant faibli et lâché prise, il est tombé lui-même : choc direct de la pièce de bois contre la partie inférieure de la jambe droite; fracture complète des deux os, celle du tibia en rave, à 4 centimètres au-dessus de l'articulation tibio-tarsienne, celle du péroné oblique, à 1 centimètre plus haut; pas de chevauchement, pas de renversement du pied, pas de déplacement. Mais après l'accident : gonflement considérable du pied et de la partie inférieure de la jambe, sans accidents généraux. On applique l'appareil polydactile à double plan incliné. Contention facile de la fracture au moyen des chevilles, sans constriction circulaire du membre (compresses froides qu'on peut souvent et aisément renouveler sans toucher à l'appareil, sans mouiller les objets de literie, grâce à la toile cirée repliée en gouttière sous le membre et conduisant l'eau à un récipient placé à l'extrémité de l'appareil).

13 mars. État général très bon, gonflement moindre. Continuation des compresses froides.

16. Plus de gonflement, coaptation parfaite, application d'un bandage dextriné qu'on laisse sécher jusqu'au lendemain sur l'appareil polydactile, où le maintenaient un petit nombre de chevilles doucement appliquées.

Fracture comminutive de la cuisse droite, sans plaie. — Appareil polydactile à chevilles mobiles. — Guérison sans chevauchement.

Observation II. — C... (Jean), âgé de 44 ans, est atteint, depuis l'enfance, d'un *varus-équin* du pied droit, avec atrophie de tout le membre et diminution de 2 à 3 centimètres dans la longueur du fémur de ce côté. L'articulation fémoro-tibiale est dans une demi-flexion permanente, sans ankylose pourtant, mais avec impossibilité d'extension plus grande. Le membre n'appuie jamais sur le sol, et la progression ne s'effectue qu'au moyen de béquilles. Dans ces conditions, le 3 juin 1858, cet homme fait sur le pavé une chute de sa hauteur : fracture comminutive du fémur droit à sa partie moyenne; crépitation multiple, déformation prononcée, mobilité considérable de l'extrémité inférieure du membre; peu de gonflement. Une médiocre extension par les mains d'un seul aide,

opère la réduction, après laquelle il ne reste plus que le raccourcissement congénial précédemment indiqué. Le membre est placé sur un appareil polydactile à plan incliné, seul applicable ici en raison de la flexion permanente de la jambe. Une fois la réduction obtenue, des chevilles la maintiennent aisément, en modelant le membre et en suivant pas à pas les changements de volume de la cuisse selon qu'elle augmente par la tuméfaction ou qu'elle diminue en revenant à son volume naturel.

A partir du 9 juin, on ne touche plus à l'appareil que pour l'enlever entièrement le 10 août suivant. Le résultat de cette application a été des plus complets ; le malade a déclaré ne pas en avoir éprouvé de gêne; un grand nombre de chevilles ont été placées, afin de mieux façonner le membre, et la guérison a eu lieu sans accident et sans le moindre raccourcissement.

Fracture comminutive de la jambe droite, avec plaie et chevauchement. — Appareil polydactile à chevilles mobiles et à pointe métallique. — Guérison sans difformité.

Observation III. — B... (Jacques), âgé de 50 ans, d'une forte constitution, reçut, le 26 décembre 1857, le choc d'une pièce volumineuse de bois sur la jambe droite : fracture comminutive à 15 centim. au-dessus des malléoles; plaie de 2 centim., oblique en dedans, à la partie antérieure de la jambe, produite par la saillie très oblique du fragment supérieur du tibia chevauchant sur l'inférieur ; péroné brisé plus bas ; hernie des parties molles. La fracture, réduite, est maintenue à l'aide de l'appareil polydactile à double plan incliné, garni d'un coussin et d'une toile cirée. (Diète ; limonade citrique.)

Les jours suivants : réaction vive, gonflement considérable, rougeur de la jambe, sphacèle et chute des parties herniées, suppuration sanieuse abondante, décollement de la peau. (Soupe. Limonade citrique ; huile de ricin, 40 grammes.)

Le 14 janvier, le fragment supérieur du tibia chevauchant encore malgré les moyens divers de compression employés jusque là, on le réduit entièrement à l'aide de la pointe métallique modifiée de M. Malgaigne, implantée sur la face interne du tibia, à 5 centimètres au-dessus

du lieu de la fracture ; pas d'inflammation ni de douleur autour de la piqûre.

20. État général satisfaisant ; l'état local s'améliore, gonflement, douleur, suppuration moindres.

10 février. La pointe métallique est enlevée ; suppuration insignifiante de la plaie de la piqûre, assez abondante encore par celle de la fracture ; les fragments restent désormais dans leurs rapports normaux.

Du 14 février au 27 mars, à part quelques accidents survenus dans la plaie, tels que douleur, écoulement difficile du pus ayant nécessité deux incisions, tout marche vers la guérison. A cette dernière époque, on trouve, au lieu d'implantation de la pointe métallique, une cicatrice légère, sans adhérence à l'os, qui est resté lisse en ce point. La consolidation de la fracture par bourgeonnement des surfaces osseuses a été longue à obtenir ; il est resté sur les téguments adhérents dans l'étendue de la lésion faite par le tibia une coloration rouge, mais la réunion est parfaite sans aucune altération de la forme du membre. Pendant tout le temps du traitement, les pansements divers, les irrigations, les lavages, les modifications à apporter au premier appareil, les incisions ont été si faciles que le chirurgien a pu les exécuter, le plus souvent, sans le secours d'aucun aide. On a noté l'absence de raideur et de souffrance dans l'articulation fémoro-tibiale, grâce aux changements assez fréquents apportés dans l'inclinaison des deux parties du plan incliné et aux mouvements imprimés à leur point de jonction.

Clinique de la ville.

Fracture comminutive grave de la jambe gauche avec plaies et chevauchement. Appareil polydactile à chevilles mobiles et à pointe métallique. Guérison.

Observation IV. — M. J..., âgé de 55 ans, d'un tempérament lymphatique, d'une assez forte constitution, se fractura la jambe gauche le 20 décembre 1857. En débarquant d'un bateau, il fit une chute pendant que son pied gauche était fortement retenu entre deux pièces de

bois : fracture très oblique de la partie moyenne du tibia, de haut en bas et de dedans en dehors ; le fragment inférieur offre, sous la peau et en dedans, une longue baguette osseuse, tandis que le biseau du supérieur a perforé les téguments en avant du membre ; péroné fracturé, en éclat, au-dessus de la malléole externe, où existent deux plaies étroites mais profondes donnant issue à une très grande quantité de sang. En présence de cette lésion qui, sous bien des rapports, semblait commander l'amputation immédiate, je me décidai à une tentative de chirurgie conservatrice : réduction impossible à obtenir complète, malgré tous les efforts, sans doute, à cause des esquilles interposées entre les os divisés, et plus difficile encore à maintenir à l'aide d'un appareil temporaire à *attelles*. (Diète. Limonade citrique ; compresses froides très souvent renouvelées.)

Le lendemain, le malade, agité, n'a pas dormi ; l'hémorrhagie a continué une partie de la nuit ; application de l'appareil polydactile à double plan incliné, muni de son coussin et d'une toile cirée ; coaptation rendue plus exacte, mais pas entièrement complète par les chevilles, dont la pression latérale est secondée par celle d'un lien antérieur. (Diète. Limonade citrique ; linge cératé sur les plaies ; compresses froides.)

22. Pas de douleur, ni de gonflement ; phlyctènes remplies de sérosité sanguinolente. (Même prescription.)

23. Même état. (40 grammes huile de ricin.)

24. Pendant la nuit, agitation, délire momentané, frissons, suivis de chaleur et de sueur ; diminution de la fièvre dans la matinée ; gonflement plus étendu de la jambe ; chute de l'épiderme des phlyctènes, qui laissent des excoriations recouvertes d'un enduit de couleur jaune d'ocre. — Une garde-robe. — Pour éviter toute compression dangereuse, on recule les chevilles placées en regard des parties du membre qui se tuméfient.—(Bouillon, soupe, eau vineuse, linge cératé, cataplasme.)

Du 25 décembre au 28 janvier, état général peu satisfaisant : inappétence, fièvre, rêvasseries, gonflement considérable du pied et de la jambe, nouvelles phlyctènes nombreuses remplies de sérosité roussâtre,

rougeur diffuse jusqu'au genou, sanie abondante, fétide, plaies grisâtres, extraction de lambeaux de tissu cellulaire sphacélé.

29. Amendement de tous les symptômes : un peu d'appétit, pas de rêvasseries, pas de fièvre. Formation de plusieurs abcès au voisinage de la malléole externe, à la partie antéro-latérale externe de la jambe, sur la crête tibiale au tiers supérieur du membre, à la face dorsale et au côté externe du pied. Des incisions sont pratiquées : suppuration par six ouvertures. L'épiderme de la jambe et du pied s'enlève en totalité. On extrait avec des pinces quatre esquilles d'un petit volume appartenant au péroné et au tibia. Les petites opérations, les pansements nombreux, les lavages répétés, sont faits plusieurs fois par jour avec rapidité, sans douleur, et sans imprimer des secousses au membre malade. Les parents eux-mêmes renouvellent les pansements, car il suffit, pour leur accomplissement, d'enlever momentanément quelques chevilles et de les replacer après l'application des pièces de l'appareil. Ce fut à cette période de la maladie que plusieurs de mes élèves et de mes confrères, et parmi ces derniers M. le docteur Goffres, vinrent voir le blessé.

Février.—Après ces diverses phases que le malade traverse, non sans donner de graves inquiétudes, le mieux est définitif. A partir du 16, gonflement, suppuration moindres, bourgeons charnus des plaies de bonne nature. On travaille alors plus directement à donner au membre une bonne configuration au moyen de chevilles que l'on rapproche de manière à exercer autour de lui une pression douce très supportable.

Mais, comme malgré les moyens les plus méthodiques de réduction et de contention applicables ici, tels que : pression latérale des chevilles, antéro-postérieure et latérale des liens coaptateurs ; abduction ou adduction du pied obtenues encore à l'aide des chevilles ; élévation du fragment inférieur par des coussins ou des liens passés au-dessous, on voit persister la saillie et un écartement sensible de la baguette osseuse du bout inférieur du tibia, et qu'il y a lieu de craindre ultérieurement une fausse articulation. — Le 26, on applique l'unique moyen de contention en quelque sorte acceptable par les tissus enflammés, mais aussi le plus héroïque, la pointe métallique de M. Malgaigne. Elle est

implantée à 3 centimètres de la fracture, sur la face interne du fragment inférieur. Nuit bonne, pas de fièvre, pas d'inflammation autour de la pointe qui porte sur le tibia à travers des tissus qui ont suppuré et qu'envahit encore un certain degré d'induration phlegmasique.

29. État satisfaisant ; coaptation plus complète de la fracture ; suppuration très peu abondante ; marche des plaies vers la cicatrisation. Cependant, le 6 *mars*, un abcès, formé lentement et profondément dans les parties molles postérieures de la jambe, s'ouvre spontanément au-dessous du talon ; le pied est alors suspendu par une sorte de hamac partiel fait à l'aide de bandes passées sous le calcanéum, se réfléchissant sur les mortaises des chevilles et fixées aux pitons de ceinture.

15 *mars*. Enlèvement de la pointe métallique qui laisse, dans les tissus encore indurés, une petite plaie ronde et vermeille qui se ferme bientôt. L'aiguille osseuse du fragment inférieur qui a nécessité son application reste désormais adhérente au fragment supérieur.

10 *avril*. Cicatrisation complète des plaies ; on enlève l'appareil polydactile resté en place depuis plus de trois mois et n'ayant subi, dans cette longue période de temps, d'autres déplacements que ceux très ménagés, d'extension et de flexion, afin de prévenir la raideur du genou, que les mouvements partiels des chevilles nécessités par les exigences de l'application des diverses pièces de pansement. Mais la consolidation n'étant pas complète encore, on applique un bandage dextriné qui permet au blessé de s'habiller, de se lever et de se promener avec des béquilles, sans appuyer sur sa jambe malade.

1er septembre. Je viens de revoir M. J..., plus de huit mois après sa blessure : la jambe fracturée est dans l'état suivant : la consolidation ne laisse rien à désirer ; les parties molles du tiers inférieur de la jambe et le pied sont encore sensiblement tuméfiées, indurées, rouges ; les cicatrices enfoncées adhèrent aux os. Il y a une courbure à convexité antérieure ; la saillie du fragment inférieur est assez sensible sur le bord interne du tibia. On découvre avec peine la cicatrice de la pointe métallique, d'ailleurs sans adhérences à l'os qui est resté lisse au point d'implantation. Le malade, qui marche encore avec des béquilles, est,

malgré la déformation légère de son membre, heureux d'un résultat pour lui inespéré ; résultat, pour nous, d'autant plus remarquable qu'il a été obtenu sans beaucoup de peine, avec le concours actif des parents, sans beaucoup de douleurs pour le patient, et après que nous avons dû, à deux reprises assez éloignées, agiter dans notre esprit l'idée de l'amputation du membre !

Personne n'ignore que des lésions aussi graves, plus graves même, ont été guéries à l'aide de tous les autres appareils, et même avec celui de Scultet dirigé par des mains exercées ; mais je puis dire que, d'après l'étude comparative et pratique que j'ai faite de tous les moyens mécaniques usités en France dans le traitement des fractures les plus compliquées, nul ne m'a paru, plus que les appareils polydactiles, réunir la simplicité, la facilité, la sûreté des pansements et des résultats.

L'auteur a fait l'exposition et la démonstration de ses nouveaux appareils, à Paris, en 1858 :

A l'Académie de médecine, séance du 5 octobre ;

A la Société de chirurgie, séance du 6 octobre ;

A l'Hôtel-Dieu (service de M. Jobert de Lamballe) ;

A l'hôpital des Cliniques (service de M. Nélaton),

MM. Broca et A. Richard étant alors en exercice.

PUBLICATIONS DU MÊME AUTEUR.

1837. *Nouvelle méthode de guérir le varicocèle* (Premier mémoire. *Gaz. méd. de Paris*, page 821). Méthode de feu J.-J. Reynaud.

1839. *Nouvelle méthode de guérir le varicocèle* (Deuxième mémoire. *Journal des connaissances médicales pratiques*, page 229).

1841. *Clinique maritime* (Observations diverses. *Gazette médicale de Paris*, page 20).

1842. *Angioleucite superficielle* (Mémoire. *Gazette médicale de Paris*, page 56).

— *Discours d'ouverture de cours. — Généralités sur l'anatomie et la physiologie* (Toulon).

1844. *Discours prononcé à l'occasion de l'inauguration du buste du docteur Fleury*, médecin en chef de la marine, mort du choléra en 1835 (Toulon).

1846. *Du bubon vénérien suppuré et de son traitement par les injections iodées* (Premier mémoire. *Archives générales de médecine*, septembre, page 1).

— *Diphthérite des voies aériennes* (*Annales de thérap.*, page 178).

— *Première lettre sur l'amputation tibio-tarsienne* (*Annales de thérap.*, page 306).

1847. *Du bubon vénérien suppuré et de son traitement par les injections iodées* (Deuxième mémoire. *Archives générales de médecine*, mars, page 297).

— *Des tumeurs squirrheuses enkystées* (Mémoire présenté à la Société de chirurgie de Paris. *Bulletin de la Société*).

— *Hydarthroses orbiculaires; de celles de l'épaule en particulier* (Mémoire lu à l'Académie nationale de médecine, le 30 septembre 1845), suivi d'une *Observation d'hydarthrose du genou* (*Gazette médicale de Paris*, pages 108 et 114).

1847. *Éthérisme à l'aide des appareils mécaniques* (Mémoire. *Gaz. méd. de Paris*, 3 avril).

— *Éthérisme dans un cas de circoncision et de taille* (*Gazette des hôpitaux*, 25 mai).

— *Éthérisme à l'aide du sac à éthérisation* (*Union médicale*, p. 326 et 345).

— *Tumeur fibro-vasculaire; ablation partielle du maxillaire inférieur* (*Gazette des hôpitaux*).

— *Note sur l'emploi de l'éther dans les opérations de la taille* (Présentée à l'Académie nationale de médecine, séance du 20 juillet).

— *De l'éthérisme dans les accouchements* (Mémoire. *Gazette médicale de Paris*, 2 et 9 octobre).

— *Trépanation mastoïdienne* (*Annales de thérap.*, page 168).

— *Hydrocèle double. Injection iodée d'un côté, alcoolique de l'autre* (*Ann. de thérap.*, page 176). Observation.

— *Nouvelle classification des fonctions de l'homme* (Mémoire lu en séance générale à Marseille, à la quatorzième session du Congrès scientifique de France, tome II, page 295).

1848. *Éthérisation répétée dans un cas de névralgie sus-orbitaire* (Présentée à l'Académie nationale de médecine, séance du 4 mai. *Annales de thérapeutique*).

— *Éthérisme pour un cas d'extraction de corps étranger dans l'œsophage* (Présenté à l'Académie nationale de médecine, séance du 15 juin. *Annales de thérapeutique*).

— *Du débridement dans l'orchite* (*Union médicale*, page 429). Note et observations.

— *De l'amputation dans la gangrène traumatique non limitée* (*Annales de thérapeutique*, page 249).

— *Luxation sous-cotyloïdienne du fémur; réduction après trente-cinq jours dans l'éthérisme* (*Annales de thérap.*, page 157).

— *Note sur un moyen d'anéantir les douleurs qui suivent les opérations chirurgicales* (Présentée à l'Académie des sciences, séance du 27 novembre).

— *Trépanation par évulsion*, nouvelle méthode (Mémoire présenté à l'Académie nationale de médecine. *Union méd.*, p. 275-285).

1848. *Éthérisme hypochloreux (chloroforme)* (Mémoire. *Union médicale*, pages 1 et 5).

— *Résections. — De celle de l'épaule en particulier* (Mémoire. *Gaz. des hôpitaux*, pages 148-156).

— *Luxation des os du métacarpe dans leur articulation carpo-métacarpienne* (Mémoire. *Union médicale*, pages 224-227).

— *De l'amputation tibio-tarsienne* (Mémoire. *Gazette des hôpitaux*).

— *De l'amputation et de l'éthérisme dans le tétanos traumatique* (Mémoire. *Union médicale*, pages 356-359).

— *Deuxième lettre sur l'amputation tibio-tarsienne* (*Gaz. des hôpitaux*, page 394).

— *Éthérisation directe* (Leçon de clinique recueillie par M. F. C. *Union médicale*).

1849. *Angioleucite profonde. Amputation coxo-fémorale* (Mémoire. *Gazette méd. de Paris*. Extrait communiqué à l'Académie des sciences, séance du 29 janvier).

— *Un accident au port de Cherbourg. Fractures diverses et appareil nouveau pour celles de la cuisse* (Brochure. Extrait dans la *Revue médico-chirurgicale*).

— *Inflammation des gaînes des tendons* (Observation présentée à la Soc. de chirurgie).

— *Lésion de la tibiale postérieure. Ligature.* (Leçon de clinique. *Union médicale*, pages 130-135-138).

— *Fractures de la colonne vertébrale* (Leçon clinique recueillie par M. F. C. *Gaz. des hôp.*).

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1851. *Amputation tibio-tarsienne.* Pages 130-147. *Union Médicale.*

— *Varicocèle.* Page 210 . . . . . Id.

— *Hémorrhoïdes internes; cure radicale.* Page 222. . . . . Id.

— *Tamponnement dans les hémorrhagies.* Pages 314-318. Id.

— *Trépanation dans la carie des os.* P. 484-492-504-508. Id.

1852. *Névralgies faciales; résection des nerfs; procédés nouveaux.* Pages 479-491-515-518 (Mémoire). . . . . Id.

1853. *Exstrophie de la vessie; procédé opératoire nouveau.* Page 449 (Mémoire). . . . . Id.

— *Hémorrhoïdes internes; caustique de Vienne.* Page 505. Id.

1855. *Choléra cutané ou sudoral.* Pages 111 et suiv. (1re mémoire). . . . . *Union Médicale.*

— *Empoisonnement et mort de cinq personnes par la teinture de colchique.* Page 145. . . . . Id.

— *Fistule du larynx. — Occlusion par substitution.* (Méthode nouvelle, page 515). . . . . Id.

— *Ascite. — Injections iodées.* (Observation. *France médicale*, p. 21.)

— *Ligature de l'artère crurale.* (Observation. *France médicale*, page 317.)

1856. *Amputation tibio-tarsienne.* (Observation. *Gazette des hôpitaux*, page 151.)

— *Kystes congéniaux du cou. — Injections iodées.* (Mémoire lu à l'Académie de médecine, séance du 26 août.)

— *Occlusions et rétrécissements du larynx.* (Mémoire lu à la Société de chirurgie, séance du 27 août. *Gazette des hôpitaux*, page 434.)

— *Discours prononcé au Banquet offert par le corps des médecins civils aux médecins des armées et des flottes alliées.* (20 août.)

1857. *Amputation de la verge. — Nouveau procédé.* — (*Gazette hebdomadaire*, p. 113.)

— *Choléra cutané ou sudoral* (2me mémoire, *Union Médicale*, page 533 et suiv.)

1858. *Appareils à fracture et à compression ; classes nouvelles ; appareils polydactiles — à chevilles mobiles ; compresseur élastique et gradué.* Leçon. (*Union Médicale.* Voir les numéros des 11 et 22 novembre, 2, 7, 14 et 21 décembre.)

1859. *Du lieu où il convient d'appliquer les ligatures dans les plaies artérielles.* (Note et observations.) *Gazette hebdomadaire.*

Paris. — Typographie Félix Malteste et Cie, rue des Deux-Portes-St-Sauveur, 22.

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FISTULE DU LARYNX.

OCCLUSION PAR SUBSTITUTION,

MÉTHODE NOUVELLE.

Publications de l'Union Médicale, du 30 Octobre 1855.

FISTULES DU LARYNX.

OCCLUSION PAR SUBSTITUTION,

MÉTHODE NOUVELLE.

PAR

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Les fistules anciennes du larynx sont le plus souvent constituées par un canal accidentel résultant de la jonction de deux *entonnoirs* inégaux, l'un externe *cutané*, l'autre interne *muqueux*, réunis par leur sommet non loin d'un cartilage qui, sur un point circonscrit, en forme l'inflexible paroi.

Dans la méthode d'*occlusion* par *substitution*, on remplace le canal ancien, muco-cutané, essentiellement inadhésible, par

un canal nouveau, celluleux, éminemment susceptible d'adhésion.

Le procédé que j'ai employé comprend deux temps :

1° Détruire le canal ancien et disposer pour une prompte réunion l'entonnoir cutané, ouverture externe.

2° Créer au voisinage un canal celluleux que remplira temporairement un corps étranger, dans le double but d'empêcher l'emphysème et de préparer l'occlusion définitive de l'entonnoir muqueux, ouverture interne.

Procédé opératoire. — Le malade, assis ou couché, a la tête tournée du côté opposé à la fistule et le menton maintenu relevé par un aide. L'opérateur placé vis-à-vis ou à côté, fait avec un bistouri une incision transversale divisant largement, de la base au sommet, l'entonnoir cutané jusqu'à la face externe du cartilage dont il est détaché. Les deux lambeaux résultant de cette incision, sont saisis avec des pinces, disséqués, renversés en dehors et conservés s'ils sont épais, bien pourvus de tissu cellulaire, ou réséqués s'ils sont minces, formés de tissu inodulaire.

Le sang abstergé et entièrement arrêté par le maintien dans la plaie, durant quelques minutes, d'une éponge imbibée d'eau froide, on détache du cartilage l'entonnoir muqueux, on le dissèque avec la pointe du bistouri, on le refoule dans l'intérieur du larynx à l'aide d'une sonde cannelée, on arrête de nouveau le sang qui s'écoule en petite quantité et l'on réunit la plaie extérieure avec des serre-fines.

Aussitôt, l'opérateur fait à la peau voisine de l'ancien canal et de préférence au-dessus, un pli, dont il confie une extrémité à un aide et dont il perce la base avec un bistouri étroit, afin de pénétrer, par un chemin sous-cutané, jusqu'à l'orifice interne de la fistule elle-même. Le pli n'est abandonné que

lorsque le bistouri a été remplacé par un *cylindre obturateur*, fragment de bougie en gomme élastique d'un calibre égal à celui de cet orifice. Le bec de la bougie doit pénétrer de quelques millimètres dans la cavité du larynx afin de boucher complétement l'ouverture fistuleuse, tandis que son extrémité externe, entourée d'un fil ciré, façonnée en forme de clou, es maintenue en place à l'aide de bandelettes de collodion.

Il est à peine nécessaire de recouvrir d'une compresse légère et d'un tour de bande, ce petit appareil qui suit, sans tiraillement, tous les mouvemens du larynx, auquel il est pour ainsi dire suspendu. (*Voyez* la planche II.)

Après cette opération, délicate si l'on veut, mais exempte de difficultés, d'hémorrhagie, de danger, voici ce qui arrive : l'air ne traversant plus l'orifice interne de la fistule, l'emphysème ne saurait se produire; l'orifice externe se cicatrise par première ou seconde intention ; autour du cylindre obturateur, le tissu cellulaire s'enflamme, se condense, suppure, bourgeonne, et ces végétations qui s'élèvent de toute part finissent par remplir et effacer l'espace profond qu'occupait autrefois l'entonnoir cutané. Alors il n'existe plus de la fistule ancienne que l'orifice interne cartilagineux. Dans son voisinage s'est formé une fistule nouvelle, dont l'ouverture interne est ainsi la même, tandis que l'externe se trouve à 2 ou 3 centimètres de l'ancienne : canal nouveau, cellulaire, à trajet oblique, dont les surfaces bourgeonnantes, imperméables à l'air, sont avides d'adhésion, et dont les orifices, couverts aussi de bourgeons charnus vivaces qui les débordent, n'ont aucune tendance à opérer dans son intérieur le renversement de la peau ou celui de la muqueuse.

C'est lorsque les choses en sont arrivées à ce point qu'il faut débarrasser la nouvelle fistule du cylindre obturateur et

couvrir d'un simple carré de taffetas gommé son ouverture extérieure.

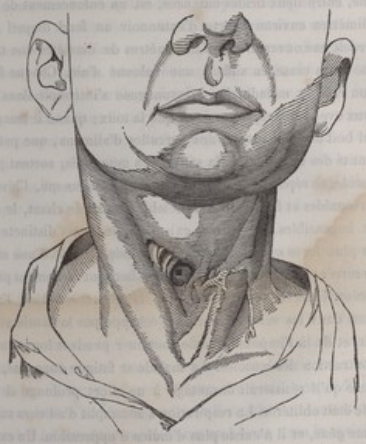
L'air qui, au premir moment, pénétrera dans la fistule ne soulèvera pas le taffetas gommé maintenu par la compression modérée de quelques tours de bande, il ne pourra pas davantage s'infiltrer à travers les parois du canal, condensées par l'inflammation, garantie suffisante contre tout emphysème secondaire. D'un autre côté, les bourgeons charnus, que la bougie avait peine à contenir, feront irruption dans l'intérieur du canal, se toucheront bientôt, adhéreront dans toute son étendue, et la cicatrisation y sera rapide. L'ouverture interne de la fistule ancienne sera donc définitivement fermée par le mécanisme aussi simple que souvent admiré de la formation du tissu inodulaire. Et telle est la puissance d'assimilation de nos tissus que, dans le court espace de la cicatrice linéaire qui vient de succéder à la fistule nouvelle, chacun d'eux tentera de métamorphoser à son profit sa part de tissu inodulaire, jusqu'à présent identique partout; c'est ainsi qu'apparaîtront, en partie au moins, à l'extrémité externe, l'organisation de la peau, à l'interne la texture fibreuse ou fibro-cartilagineuse, et dans l'intervalle la trame du tissu cellulaire. Tels sont donc les états transitoires par lesquels la fistule nouvelle devra passer pour arriver à l'oblitération de l'orifice interne de la fistule ancienne ; et telle est la succession des pensées qui, avant de prendre le bistouri, nous a fait entrevoir le bouchon celluleux d'abord, puis fibreux ou fibro-cartilagineux qui, dans notre nouvelle méthode, devait amener la guérison radicale des fistules anciennes du larynx. Notons enfin avec soin que cette guérison devra se faire *en deux temps*, puisque l'occlusion de l'orifice interne de la fistule ne sera jamais obtenue que plusieurs jours après celle de l'orifice externe, quand le

tissu cellulaire aura été convenablement modifié par le travail inflammatoire.

Les considérations qui précèdent vont recevoir un nouveau jour de l'exposition pratique du fait qui a fait naître la méthode et provoqué l'application du procédé.

Observation. — Le 17 septembre 1852, Véjux, dans une tentative de suicide, se fit, avec un rasoir tenu de la main droite, une large plaie pénétrante du laryux. Ce condamné est d'une taille moyenne, d'une constitution robuste et d'un tempérament sanguin.

Le 8 juillet 1853, je le vis pour la première fois à l'hôpital



(Planche I^re.)

du bagne de Toulon. Il présentait une fistule aérienne au côté droit du larynx ; la respiration était gênée ; l'oppression habituelle ; de temps en temps la plaie donnait issue à de petits fragmens de cartilage ; circonstances qui me déterminèrent à retarder toute opération.

Le 12 février 1855, le condamné entre de nouveau à l'hôpital dans un état plus satisfaisant.

Une cicatrice assez large, enfoncée, courbe, à concavité supérieure, s'étend d'un muscle sterno-mastoïdien à celui du côté opposé, et répond au bord inférieur du cartilage thyroïde (*Voir* planche I^re^). Au côté droit et près de la ligne médiane, entre deux brides cutanées, est un enfoncement de 12 millimètres environ, sorte d'entonnoir au fond duquel on aperçoit une ouverture de 5 millimètres de diamètre que traverse sans cesse en sifflant une colonne d'air. Chaque fois qu'on rase le malade, l'eau savonneuse s'introduit dans le larynx avec l'air inspiré et provoque la toux ; quand il mange, qu'il boit ou qu'il tousse, des parcelles d'alimens, une petite quantité des boissons, de la salive, des mucosités, sortent par la fistule, se répandent sur le cou et les vêtemens qui, l'hiver, sont humides et froids. La voix semble abolie ; le chant, le cri sont impossibles. La parole existe, faible, mais distincte et bien plus forte quand la fistule est fermée à l'aide d'une cravate serrée ; toutes les lettres de l'alphabet sont facilement prononcées. Dans les efforts, alors que la glotte est close, l'air retenu dans les voies aériennes s'échappe par la fistule avec bruit, et de là l'impossibilité de continuer pendant longtemps la contraction des muscles. Le malade se fatigue donc vite, et déclare qu'il résisterait davantage à un effort prolongé si la fistule était oblitérée. La respiration s'accomplit d'ailleurs sans aucune gêne, et il n'existe plus d'indice d'oppression. Un examen attentif fait encore reconnaître que la cicatrice forme

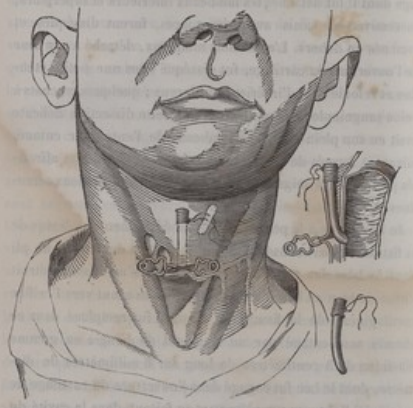
éperon dans la cavité du larynx qu'elle rétrécit ; je me suis cependant assuré que la colonne d'air qui, dans l'inspiration, pénètre par la fistule dans les poumons, n'est pas essentielle à l'hématose, puisque, pendant trois jours, j'ai pu la supprimer sans inconvénient en bouchant l'ouverture fistuleuse avec une sonde en gomme élastique. Ce dernier fait, d'une importance majeure, étant bien acquis, je procédai, le 28 février, à l'opération.

Le malade étant assis sur une chaise en face d'une fenêtre, la tête légèrement inclinée en arrière et appuyée sur la poitrine d'un aide, je fis sur l'entonnoir cutané de la fistule une incision transversale qui le divisa complétement jusqu'au cartilage dont il fut détaché ; les lambeaux inférieurs et supérieurs, successivement saisis avec des pinces, furent disséqués et ramenés en dehors. L'entonnoir muqueux, détaché à son tour de l'ouverture du cartilage, fut disséqué dans une petite étendue et refoulé dans l'intérieur du larynx ; quelques crachats à peine sanguinolens démontrèrent que cette dissection délicate avait eu son plein effet. Les lambeaux de l'entonnoir cutané, minces et formés de tissu inodulaire, furent cependant affrontés par leur face saignante et maintenus à l'aide de deux serre-fines.

Je fis ensuite à la peau du cou, immédiatement au-dessus de la fistule et, par conséquent, au côté droit du larynx, un pli dont la base fut traversée par la pointe d'un bistouri étroit dirigé de haut en bas et un peu d'arrière en avant vers l'orifice cartilagineux de la fistule. Le bistouri fut remplacé dans ce chemin sous-cutané par un fragment de bougie en gomme élastique de 3 centimètres de long sur 6 millimètres de diamètre, dont le bec fut engagé dans l'ouverture du cartilage de manière à l'obturer complétement en faisant, dans la cavité du

larynx, une saillie de quelques millimètres seulement. Le pli de la peau fut alors abandonné, et l'extrémité externe de la bougie, entourée de fil ciré, fut maintenue en place à l'aide de bandelettes de collodion fixées sur la peau voisine du bord supérieur du cartilage thyroïde, de sorte que ce petit appareil suivait, sans courir risque de se déplacer, tous les mouvemens que lui imprimaient les actes de la respiration, de la déglutition, de la phonation, etc.

La planche II est destinée à compléter la description que je viens de donner en montrant, de face et de profil, tous les détails de l'opération ainsi que le cylindre obturateur qui est représenté avec ses dimensions naturelles.



(Planche II.)

Toutes ces manœuvres opératoires, assez longues à exposer, furent cependant accomplies assez rapidement.

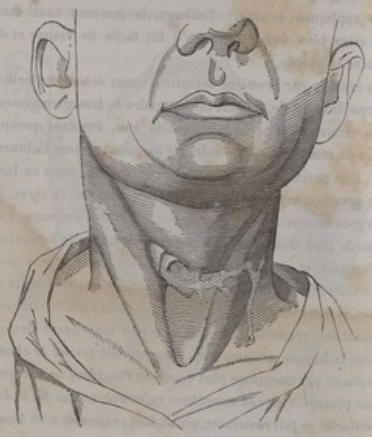
Le lendemain tout allait bien; l'appareil ne s'était pas dérangé et le malade n'avait rien changé à ses habitudes. On enleva les serre-fines qu'on remplaça par de légères couches de collodion.

Les jours suivans, le tissu cellulaire s'enflamma autour du cylindre obturateur; la peau rougit assez pour nécessiter l'application de cataplasmes émolliens; la plaie de l'ancienne fistule suppura; il y eut de la toux, mais l'appareil n'en fut pas dérangé par l'attention qu'avait la malade de le renforcer en y appliquant sa main; d'ailleurs, le nouveau canal était déjà assez bien établi pour qu'il fût facile de retirer et de replacer la bougie.

La réunion par première intention ayant échoué à l'orifice externe de la fistule, il fallut bien attendre le bourgeonnement et la cicatrisation secondaire qui la suit. Pendant quelque temps on remarqua qu'en enlevant momentanément l'obturateur, l'air passait à la fois par les deux fistules, mais en bien plus grande quantité par la nouvelle; vers le 15 mars, le bourgeonnement ayant entièrement oblitéré l'ancienne, l'air ne sortit plus désormais que par celle de nouvelle formation.

Une nuit, et tout à coup, la respiration s'embarrassa pour la première fois et le sommeil fut incomplet. A notre visite du matin, il nous fut aisé de reconnaître que le malade, en comprimant son appareil, avait fait pénétrer trop avant dans le larynx la bougie un peu trop longue; elle fut sur le champ remplacée par une autre plus courte et l'accident ne se reproduisit plus. (*Un clou en caoutchouc vulcanisé, tel que M. le docteur Gariel en fait construire, serait bien préférable à la bougie que j'ai employée.*)

Cependant l'inflammation se modéra autour de ces deux fistules, la suppuration diminua, et la cicatrisation fit des progrès dans l'ancien trajet fistuleux, qui pourtant ne fut complétement réuni que vers la fin du mois de mars. A cette époque, les bourgeons charnus étaient si développés dans le canal nouveau qu'ils en débordaient l'ouverture extérieure. Le 2 avril, la bougie obturatrice fut définitivement retirée, la plaie extérieure couverte de taffetas gommé. Il n'y eut pas la plus légère trace d'emphysème, et dès le soir du même jour l'air ne traversait plus la fistule qui était entièrement oblitérée quatre jours après.



(Planche III.)

Ainsi la guérison, pour être parfaite, a exigé trente-huit jours; mais il n'échappera à personne que ce terme doit être le plus reculé dans des opérations de ce genre, puisque, dans l'observation qui précède, la réunion immédiate de l'ouverture externe n'ayant pas eu lieu, il a fallu attendre la réunion secondaire qui est toujours tardive. Il est permis d'espérer que la moitié du temps indiqué plus haut sera suffisante pour obtenir la guérison dans les circonstances favorables où l'orifice externe de la fistule se sera primitivement réuni.

Je viens de revoir Véjux trois mois après sa sortie de l'hôpital. La guérison est restée complète, comme on peut en juger par la planche III.

La peau du cou, modifiée par l'inflammation, a recouvré ses caractères normaux; la cicatrice nouvelle est peu apparente, l'ancienne est moins difforme. On ne peut reconnaître, par le toucher, la place du canal celluleux. Le condamné est retourné aux rudes travaux *de la fatigue*; l'effort est devenu aussi prolongé qu'avant la blessure; la voix est plus forte, quoique toujours voilée, ce qui dépend sans doute de la lésion traumatique primitive des cordes vocales.

Appréciation. — La méthode d'occlusion par substitution se distinguera, je l'espère, par la sûreté du résultat. Je ne puis entrevoir, comme susceptible de l'empêcher, que l'inflammation intense des voies aériennes, forçant à ôter le cylindre obturateur qui en serait la cause, et à rétablir l'ancien état des lieux. Mais dans les fistules anciennes dont la thérapeutique nous occupe, la muqueuse du larynx n'a-t-elle pas perdu de son impressionnabilité par les courans anormaux de substances gazeuses, liquides, molles ou solides qui se sont établis? Cette membrane, qui supporte si bien les canules volu-

mineuses après les opérations de laryngo-trachéotomie, sera-t-elle moins tolérante pour le bec d'une bougie qui ne la touchera que dans un point très circonscrit? D'ailleurs, avant l'opération, on aura pu l'habituer tellement à ce contact, que la crainte d'une réaction inflammatoire vive sera certainement bien éloignée. Et si l'on objectait que la dissection de l'entonnoir muqueux est pour la membrane une cause de phlegmasie redoutable, je répondrais que ce temps de l'opération peut être réduit au simple avivement, indispensable dans tous les procédés d'autoplastie appliqués aux voies aériennes.

Dans l'opération que j'ai pratiquée, le nœud de la difficulté était en entier dans l'oblitération définitive de la portion cartilagineuse ou fibro-cartilagineuse de la fistule. Or, j'ai désespéré de l'obtenir par des cautérisations successives, peu susceptibles de provoquer un degré suffisant de bourgeonnement dans un tel anneau. Le rétrécissement du larynx par l'éperon cicatriciel, ainsi que le tissu inodulaire étendu autour de la fistule m'ont aussi éloigné des deux procédés autoplastiques de M. Velpeau, sur lesquels M. Jobert (de Lamballe) a surtout insisté dans son *Traité de chirurgie plastique*, tome II, page 5.

Dans le travail qu'on vient de lire, j'ai tenu à rester dans les limites de l'observation et dans la sphère des déductions qui en découlent. Il m'eût été facile d'aller plus loin : c'est ainsi qu'au premier procédé que j'ai exposé, j'aurai pu en ajouter un second; car n'est-il pas facile de concevoir que, dans des circonstances propices, le canal celluleux fait *à distance* de la fistule, pourra être créé *sur place*, le cylindre obturateur étant directement placé dans la plaie celluleuse qui succède à la destruction du canal muco-cutané? C'est ainsi que la dissection

de l'entonnoir muqueux et son refoulement dans la cavité du larynx pourra devenir le principe d'une autoplastie à lambeau interne qu'il ne sera peut-être pas impossible d'appliquer un jour à la guérison des fistules aériennes. D'autre part, qui affirmera que nul ne réalisera l'idée de fermer l'ouverture interne de la fistule à l'aide d'un obturateur *spécial*, laissé à demeure dans la plaie réunie sur lui et que l'absorption fera ultérieurement disparaître; ou dont l'élimination pourra s'effectuer soit spontanément, soit par les secours de l'art, et, dans ce dernier cas, dans un ou deux temps, par l'extérieur ou par l'intérieur des voies naturelles?

Ce ne sont là, évidemment, que des vues *à priori*, qui se groupent autour de ma nouvelle méthode, et qui, tout en attendant un cas favorable, un opérateur résolu, en un mot, la sanction de l'expérience, ne paraîtront cependant pas sans valeur quand on voudra bien envisager l'*occlusion par substitution* dans ses applications à la guérison des fistules diverses que les voies naturelles peuvent offrir.

Enfin, si l'opération que nous avons pratiquée avec succès, fixe assez l'attention des chirurgiens pour qu'ils lui donnent une place dans leurs livres didactiques, ils ne manqueront pas de la ranger parmi celles que nécessitent les maladies des voies aérifères, à côté des procédés connus pour remédier aux fistules du larynx. Mais, à un point de vue plus général, à quel *genre d'opération* rattachera-t-on la méthode d'occlusion par substitution? Touche-t-elle à la *chirurgie plastique*? Tient-elle plutôt à l'ordre des opérations *en deux temps*, sur lesquelles M. Vidal (de Cassis) a plus particulièrement appelé l'attention? Ce sont là des questions que je me contente de poser, sans chercher à les résoudre ici.

Paris. — Typographie Félix Malteste et Cᵉ, rue des Deux-Portes-St-Sauveur, 22.

PROFESSOR SPENCE'S CASE OF AMPUTATION AT THE HIP JOINT.

CASE

OF

SUCCESSFUL

AMPUTATION AT THE HIP-JOINT,

ON ACCOUNT OF

MALIGNANT TUMOUR OF THE FEMUR.

BY

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MDCCCLXV.

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AMPUTATION AT THE HIP-JOINT.

WHILST it is generally admitted that the true principle in regard to amputation for malignant tumours of bone is to amputate beyond the bone affected, yet in the case of the femur, the dread of the immediate risks of amputation at the hip-joint has led practically to the abandonment of the principle, and amputation through, or near the trochanters, in cases of malignant tumour, is often advised, and resorted to, as being safer than disarticulation, unless the growth is so high up as nearly to involve the trochanter. I think this a very serious error, as, I believe, in such tumours, the disease permeates the whole of the medullary and cancellated texture of the femur, and that there is no security for the removal of the disease except in removal of the entire bone, by disarticulation; and from what I have seen of high amputations in the thigh, for malignant tumours, I believe the risks of amputation through or near the trochanters to be as great, if not greater, than those of amputation at the joint. In the latter, the rapidity of performance is greater, the loss of blood less; whilst the risks of pyæmia are certainly less in cases of disarticulation than in amputation through the continuity of a bone, where we have the chances of myelitis, inflammation of the veins of the medullary Haversian canals, and acute necrosis, which are especially liable to occur in the state of the system accompanying malignant disease. In my own practice, out of above one hundred cases of amputation of the thigh, there have been five for malignant tumours of the femur, and of these, four have proved fatal; whilst the successful case was one of amputation at the middle of the femur, for malignant disease of the condyles.

The following seems to me a case in point, as being the second in which I have amputated at the hip-joint, for malignant growth of the femur; and in both with success:—

CASE.—M. W., aged 5 years, was admitted on May 29, 1865, into the Royal Infirmary, suffering from a tumour of the right thigh.

History.—Patient's mother states, that about six months previous to admission the child complained occasionally of wandering pains

in the right thigh, for which fomentations were applied. About three months previous to admission, however, the mother observed the patient walking as if her right knee was stiff; she had a considerable amount of pain in the limb; was sometimes fretful and low-spirited, but her general health was good. On being asked where she had pain, the patient referred it to various parts of the thigh; and on examining locally, the mother observed an oval lump on the outside of the lower part of the thigh, about the size of a "blackbird's egg," and said to be deeply seated. No increase of growth was observed, however, till about ten weeks before admission, when the child is said to have received a blow on the lower part of the thigh (with a chair), and since that time the tumour has been increasing rapidly. Since then, the patient has also complained greatly of pains in the limb, on account of which the part has been fomented, poulticed, and leeched, without any relief. The parents then consulted Dr Thomson of Yetholm, who, recognising the nature of the case, prevailed upon them to send her to the Infirmary. During the last few days, the patient has been losing her appetite, is low-spirited, and complains more of pains.

On admission into hospital.—Patient appears to be healthy, but is unusually quiet and reserved. Tongue slightly furred; lungs, heart, and other organs, normal. A tumour, of oval form, 5½ inches in length, and about the same in breadth, was found occupying the anterior, outer, and posterior surfaces of the middle and lower part of the femur, just above the condyles. It is of firm consistence throughout, and movable along with the femur. The superficial veins are enlarged, but the skin is not adherent. Patient does not complain of pain on pressing the tumour. The inguinal glands on both sides, as also the right cervical glands, are hard, and somewhat enlarged.

1*st June.*—P. 86. Sleeps well, and is much better in health. Ordered alterative medicine, followed by tincture of the muriate of iron and cod-liver oil, twice daily.

6*th.*—P. 96. Has had more darting pains in the limb. General health continues good. Tumour not perceptibly larger since admission of patient into hospital.

7*th.*—P. 80. Slept well. Chloroform having been administered, Professor Spence made an exploratory incision into the swelling, and discovered it to be a tumour, as diagnosed. The patient's pelvis was then brought well over the edge of the table, and held firmly by an assistant. Professor Spence next, grasping the soft parts with his left hand, entered the point of the knife at the front of the ischial tuberosity, and passing it obliquely upwards in front of the articulation, brought it out almost midway between the anterior superior iliac spine and the trochanter major, so as to form a large anterior flap. Having opened the joint by this first incision, while Dr Gillespie abducted the limb, the disarticulation was effected, and a posterior flap nearly equal in size to the anterior one was cut from within outwards. Immediately thereafter, a sponge

was applied over the posterior flap; Dr Watson compressed the vessels over the brim of the pelvis. The vessels, including the femoral vein, were then ligatured, the flaps stitched together, pads placed over the anterior and posterior surfaces, and bandaged. When the effects of the chloroform had passed off, an opiate was given, but the patient continued very restless, requiring to be held down for some time. No reactionary hæmorrhage took place.

On examining the limb, the tumour was found to be of a greyish colour, of firm consistence, and of a medullary character. Microscopic examination of the abductor muscles of the thigh showed the nuclei of the muscular fibres to be greatly increased in number, and seemingly about to undergo cancerous degeneration. The fibres of the gluteus muscle showed fatty degeneration, but no proliferous cells.

6.30 P.M.—P. 80. Patient has been sleeping continuously for some hours, is very thirsty and restless at intervals, and vomits on trying to take food.

9 P.M.—P. 100. Urine drawn off with a catheter. Opiate given as vomiting continued.

8*th.*—P. 100. Spent a very good night. Urine drawn off with a catheter.

4.30 P.M.—Patient has been sinking gradually, and is now unconscious. Pulse, not perceptible; respiration, rapid and very weak; has slight bronchitis; eyelids partially closed, and eyes oscillating. Ordered Spt. ammon. arom. in five-drop doses, every five minutes; also an enema of beef-tea and wine, and a mustard-poultice to the chest.

6.30 P.M.—Still continues in a very weak state. P. 156, and very weak; respirations, 60 per minute; has had her bowels opened freely. Beef-tea injections given every hour, and sal-volatile at intervals.

11 P.M.—Under this treatment patient rallied gradually; but as the nervous symptoms continued, fifteen drops of sol. mur. morph. were added to the beef-tea injections. P. 140; respirations, 40 per minute and regular; has grinding of the teeth, twitchings of the face, with knitting of the brows, and gives occasional starting and delirious exclamations.

1.30 P.M.—P. 150, weak. Cerebral symptoms and general weakness somewhat increased.

9*th*, 10 A.M.—Has slept well during the night, and cerebral symptoms are absent. P. 140, weak; takes no food, and is supported by enemata; respiration regular and not laboured.

4 P.M.—Continues in much the same condition; has occasional grinding of the teeth and startings of the limbs. P. 112. Supported by enemata.

10 P.M.—P. 130, and weak. Same treatment continued.

12.30.—P. 140, and weak. Consciousness returned and patient is inclined to sleep; cough somewhat increased, and pain in

the abdomen complained of. Ordered a large poultice over the chest and abdomen; takes some food.

10*th*, 4 A.M.—P. 120. Has been sleeping calmly, but is beginning to start somewhat, and grinds her teeth slightly.

8 A.M.—P. 104. Very weak; is unconscious; grinds her teeth; lies with her eyes wide open, and complains of great tenderness in abdomen. Enemata continued, and poultices on abdomen.

10 A.M.—P. 116. Drinks milk heartily; stump dressed and looking healthy.

12 M.—P. 120. Weak; some of the old symptoms returned. Enema given. From this time forward, patient gradually recovered. None of the cerebral symptoms returned, and appetite gradually improved.

11*th*.—P. 100. Is in good spirits; slight erythema along the edge of the wound. Some stitches removed. Discharge somewhat increased.

12*th*.—P. 108.—Patient continues to do well. This morning she took a hearty breakfast of porridge and milk, in addition to tea, toast, and eggs. The stump looks very well; there is not much discharge, and it is of a healthy character. As the cough is troublesome she is ordered to-day the following mixture:—℞ Ammon. sesquicarb. grs. xxiv.; tinc. scillae, ʒii.; decocti Senegae, ad ʒvi.; sig. a teaspoonful every three hours.

13*th*.—P. 104, of good strength. During the night she slept well, but was observed to start occasionally. Plasters applied to stump, and stitches removed. Dressed with soda lotion.

15*th*.—P. 90; bowels regular; appetite good.

17*th*.—All the ligatures except one have separated. General health continues to improve. At the inner angle of the stump is a hard, red, and painful swelling, evidently an abscess commencing to form; for this fomentations were applied. P. 110.

21*st*.—P. varied from 104 to 120 during the night. Stump looking very well. Sleeps soundly. Appetite good.

23*d*.—P. 104. Yesterday, passed four, and to-day eighteen ascarides lumbricoides, of which some were very large. Ordered a purgative, followed by ℞ Santonin, gr. viii.; sacchar, ʒi.; M., et divide in pulv. iv.; Sig. one to be taken night and morning.

25*th*.—Passed two more worms of the same kind, but smaller. Appetite has fallen off somewhat. The abscess in the groin burst to-day at the outer angle of the stump.

July 3*d*.—Since last report convalescence has been uninterrupted. To-day passed another small worm, which was the last.

From this date onward the patient improved daily. Appetite returned by degrees. The femoral ligature was withdrawn on July 6th, and the incision healed up without the slightest bad sign, and remains quite sound at the present date.

Remarks.—Besides the interest which attaches to a successful

case of amputation at the hip-joint, that just recorded possesses interest in regard to the diagnosis of the disease, and the condition and treatment of the patient after the operation.

The general history of the disease from its commencement; the obscure wandering pains referred to the thigh long before any alteration in the limb was detected, and then the appearance of a small but distinct lateral swelling as described by her mother, together with the subsequent rapid growth and increased pain, were all very characteristic of malignant disease of the femur. On the other hand, however, there was not the slightest appearance of the peculiar cachectic state which so generally accompanies malignant growths; the child was of ruddy complexion and plump, her appetite good, and all the functions natural, though she was restless and somewhat irritable at night. The mother, however, had with her another younger child, evidently affected with strumous swelling of the periosteum, bones, and glands. At the time of the patient's admission into hospital there was no lateral projecting swelling, simply an elongated ovoid swelling, or enlargement of the femur, from the condyles to near the trochanters. Under these circumstances the question arose,—Might not these symptoms be caused by periostitis and subacute ostitis, and perhaps incipient necrosis? To my own mind, the absence of rigors or febrile symptoms at any time during the progress of the disease, the distinct lateral swelling noticed at first, and the peculiar ovoid form of the enlarged femur, seemed pretty conclusive as to its being a malignant tumor of the bone; but still, under the circumstances, before proceeding to such an extreme measure as amputation at the hip-joint, I considered it right to resort to an exploratory incision, as recorded in the report. In many instances a free exploratory incision will at once satisfy the surgeon as to the true state of matters; but here it had a tendency to mislead, for owing to the cancerous deposit being situated partly within the medullary canal of the femur, and partly between the periosteum and the shaft of the bone, and easily separable, it resulted that when I introduced my finger into the incision, I felt the bone bare and loosely connected, with swollen periosteum, just as in a case of necrosis, so that I had to enlarge the incision considerably to judge of the true state of the swelling. I draw attention to this, because unless I had been pretty well decided before as to the nature of the disease, the condition presented in this case, so different from the irregular softened mass mixed with osseous spiculæ, generally met with in malignant osseous tumours, might have led to a wrong diagnosis and most disastrous results.

The method of operating in this case was the same as that I adopted in the case of L. S., published in this Journal, vol. viii. page 585, and I think it the best in such cases where we have the power of choosing our procedure. Amputation at the hip can be readily performed by cutting one very large anterior flap, and disarticulating

and dividing the posterior parts almost directly backwards; but as examination shows that even at an early period the muscles near the diseased bone are liable to be affected, it is of vital importance to plan our operations to avoid proximity to the tumour, so as to diminish the risk of retaining any morbid tissue in the flaps. Hence I prefer two shorter flaps to one very long one, as it must encroach more on the altered parts by its greater length. Rapidity of execution in this operation is of great importance, as diminishing the risk from loss of blood; and in cases of tumours where we have the leverage of the whole limb, the disarticulation may be accomplished in from ten to twenty seconds. The chief things to be attended to for its rapid performance are,—attention to the position of the patient; that the hip projects well over the table, whilst the pelvis is kept firmly secured, so as to prevent the body receding: this allows the limb to be fully depressed after the anterior flap is formed, and also facilitates the other movements necessary for enabling the knife to be passed readily beyond the trochanter major, so as to cut the posterior flap. The direction given to the knife in passing it across the front of the limb to form the anterior flap is all-important as to the ease with which the subsequent steps will be accomplished. In operating on the right thigh, the surgeon, standing on the inside of the limb, which must be abducted, and slightly flexed on the pelvis, should enter the knife immediately in front of the tuber ischii, and carry it steadily in an oblique direction across the front of the joint to a point nearly midway between the great trochanter and crest of the ilium. In doing this great care must be taken to make the knife pass close in front of the head of the femur, so that when the flap is formed and raised, the capsule will be found to be opened, and when the limb is forcibly depressed the head of the femur either at once starts out, or a single cut upon it divides the remaining portion of the capsular and round ligaments, and nothing remains to be done but to clear the trochanter major, and form the posterior flap. In this case the common femoral artery was commanded by manual pressure, and the vessels on the posterior flap by a large sponge firmly applied the instant the limb was severed. The abdominal aorta could have been readily compressed if required; but, as I have found in other cases, the means above mentioned were quite sufficient, and less blood was lost than in an ordinary amputation of the thigh. In this as in other successful cases I have recorded, the femoral vein was tied to arrest bleeding, and I believe, as I have stated elsewhere, that instead of being hurtful it seems rather to do good, by preventing pus or unhealthy discharge entering the venous circulation by the large open mouth of the vein kept patent as it is by its fascial connexions.

The progress of the case as given in the report shows how much success in such operations depends on careful after-treatment, watchfulness of symptoms, and persistence in appropriate remedial measures, even when the condition of the patient seems very hopeless.

It will be noticed that the urgent unfavourable symptoms in this case did not supervene till about twenty-four hours after the operation, when the risk from primary shock and reactionary hæmorrhage had passed. The morning report on the 8th June was, "Pulse 100; spent a very good night," and at my visit at noon the child presented no unfavourable symptom; but shortly after 3 P.M. symptoms of restlessness, nausea, and a state approaching to collapse, as detailed in the report, set in suddenly, and at 4 P.M. she seemed to be rapidly sinking. I believe that, but for her being very carefully watched, and the prompt and continued use of external and internal stimuli, the little patient must have soon died.

The character of the symptoms was peculiar: there had not been the slightest amount of reactionary oozing from the stump, and the child had slept well after the operation. Yet the state must have been the effect of the operation on the nervous system; although it is just possible that the tenderness of the abdomen, the grinding of the teeth, and convulsive startings, may have been due to the presence of so many large intestinal worms; for though the more severe symptoms passed off, and she gradually began to amend, yet her rapid and thorough convalescence dated from the time the worms disappeared under the use of the santonine.

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EXCISION

OF

ONE LATERAL HALF OF THE TONGUE.

BY

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EXCISION

OF

ONE LATERAL HALF OF THE TONGUE.

This second successful case of removal of one entire lateral half of the tongue, by division of the lower jaw at the symphysis, has satisfied me that this is a safe and efficacious operation, affording the operator the opportunity of ascertaining, during its progress, the extent of the disease, and so directing his incisions as to remove all diseased structure. Before having recourse to the knife, I carefully considered how the wire of an ecraseur could be applied so as to bisect the tongue and divide its posterior attachment close to the tonsil, to which point the disease seemed to extend. Failing to satisfy myself that this could be done with sufficient certainty, I adopted the operation to be detailed. The history of the case is shortly as follows:—

Benjamin Brown, aged 51, by occupation a cloth-glazer, was recommended to me by Dr Cullen of Alexandria, in the month of July. At that time he had an ulcer on the right side of the tongue, the base of which was hard and painful. As there were some sharp irregular teeth opposite the sore, I recommended the extraction of these and some soothing treatment for a few weeks. The ulcer, he stated, was of four months' standing. The treatment recommended having failed to produce any effect, he was admitted to the Infirmary on the 5th September 1866. At that date there was a deep ulcer on the right side of the tongue, far back, with thickened, hard, everted edges. There was pain in the tongue, side of head and ear, and other signs of epithelial cancer of the tongue.

11*th Sept.*—To-day I removed the ulcerated part of tongue with the ecraseur, keeping the chain of the instrument seemingly free of the hardness by inserting needles through the tongue into the soft part. No vessel required ligature, the ecraseur dividing the tissues slowly, and the diseased part seemed well removed. However, the crushed appearance of the divided part did not afford an opportunity of judging accurately of the nature of the tissues through which the division was made.

On the 21st September he was dismissed, with the parts apparently cicatrizing.

Re-admitted on 11th December. Shortly after leaving the hospital the disease re-appeared in the site of the wound, and rapidly advanced. There is now a large eroded ulcer at the back part of tongue on the right side. The whole base of the tongue seems invaded on that side by a hard tumour, which causes great pain on deglutition, the pain shooting back to the ear, and affecting the whole side of the head. The patient was willing to submit to a more extensive operation for its relief.

On the 15th of December, the operation was performed in the following way:—The patient having been put deeply under the influence of chloroform, the lower lip was divided in the middle line, the incision being carried below the chin to the hyoid bone. The lower jaw was now sawed through at the symphysis, and the two halves held apart, giving free access to the mouth. An incision was made in the mucous membrane inside the right half of the lower jaw, and the sublingual gland raised from the floor of the mouth, the attachment of the genio-hyo-glossus being divided to facilitate the raising of the tongue from the mylo-hyoid. In dissecting up the sublingual gland, a considerable artery was cut and tied. I believe it was a large branch of the facial perforating the floor of the mouth to reach the gland, as I have often seen in dissection. The tongue was now pulled out, and cleft in the mesial line back to its attachment to the epiglottis. The right half could now be pulled well forward so as to allow of my finger being slipped behind it to examine the exact extent of the disease. I found that, by dividing the anterior curtain of the fauces, keeping the knife close to the tonsil, I could remove all trace of diseased tissue. This I accordingly did with a probe-pointed knife, and so removed entirely the right half of the tongue. The lingual artery was seen spouting close to the hyoid bone, and was secured without delay. Although for nearly a minute there was considerable gurgling, from the blood getting behind the epiglottis, at no time was there any danger of suffocation, the glottis seeming to retain its power even under chloroform. When the blood was sponged away, it was seen that no other vessel required ligature, the incision having been made fairly in the middle line.

The halves of the divided jaw were approximated and kept in apposition by a strong silver wire passed through a hole drilled on each side of the section of the bone. The lip was united by silver sutures, an opening being preserved in the floor of the mouth by a bit of drainage tube. This I consider of great importance to preserve an exit for the discharge, which often has a foul odour after operations on the mouth. As an additional precaution against this foulness, I smeared all the cut surfaces with a strong solution of the chloride of zinc, which has a powerful effect in preventing decomposition in wounds.

The patient was ordered an injection of 60 drops of laudanum, and to take nothing into the mouth but small bits of ice to relieve thirst, if it became urgent.

16*th*.—Patient has passed a fair night. Pulse 100. Has swallowed very little. On attempting, he managed to swallow a few teaspoonfuls of sherry, but with considerable difficulty. Having satisfied myself that he could take some sustenance by the mouth if necessary, I ordered him to abstain from that as much as possible, and determined to nourish by the rectum for a few days, so as to give absolute rest to the mouth and jaw. He was therefore ordered to have an injection of four ounces of strong beef-tea, and two ounces of port-wine, thrice daily, the last injection at night to contain sixty drops of laudanum.

17*th*.—Is comfortable this morning, having slept well during the night. The right side of face and head is yellowish in colour, but that evidently depends on the bruising caused by the forcible separation of the jaws. The drainage-tube causing some uneasiness, is removed, the opening being patent.

18*th*.—Doing well. Some tension existing below chin, the drainage opening was enlarged by introducing a dressing-forceps and expanding the blades. He is ordered to wash his mouth frequently with a saturated solution of chlorate of potash, and as much as possible to spit out all the secretion from the wound.

19*th*.—Deglutition having become more easy, he is ordered to swallow small quantities of chicken-jelly and sherry frequently. The sutures were removed from lip and chin, and the incision found united throughout.

21*st*.—Continues favourable. The discharge from below chin very free. Fluids introduced into the mouth pass out by the opening, but this can be checked temporarily by pressing the finger against it. He shaved his beard this morning.

23*d*.—Patient continuing very well, and being able to swallow freely, the nutritious enemata were discontinued.

25*th*.—Keeping favourable: he is to sit up to-day.

11*th January* 1867.—This morning the patient walked into the theatre to show the result at the clinical lecture. The wound is cicatrized throughout. The jaw is completely united. The patient is quite free of pain, and can swallow perfectly well. Already he can speak so as to make himself understood.

As in the case I operated on a year ago, the tongue is turned round upon itself, the cut surface being underneath, so that the remaining half occupies the median line. The finger detects no hardness or symptom of remaining disease. I anticipate that this formidable operation will be followed by permanent relief, as in my former case, the present condition of which I noted in the December number of this Journal (1866).

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ON TRACHEOTOMY

IN

DIPHTHERIA.

BY

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MDCCCLXV

ON TRACHEOTOMY

IN

DIPHTHERIA.

In some papers on this subject I have called attention to the two modes in which Diphtheria proves fatal. In one class of cases the death is from asthenia, in another from apnœa. In those in which the patient sinks from debility, the surgeon is unable to ward off the fatal result; in the other, when suffocation is imminent from extension of the diphtheritic exudation into the larynx and trachea, then tracheotomy will prevent the impending death, and in many cases give time for the patient to recover from the disease. While always willing to admit that at certain stages of *croup* tracheotomy was admissible, I was at first a partaker of the wide-spread opinion that it was not practicable in diphtheria; but experience has shown me that it is quite as applicable to those cases of diphtheria to which I have just alluded, as it is to cases of croup.

I have elsewhere published the result of fifteen cases with five recoveries; I now report other six operations, with two recoveries. Such operations require a large number of cases to make the statistics of any avail, but I have always held that this is not an operation to be affected by figures. The question is, "Can tracheotomy save the lives of any children after medical treatment has proved unavailing?" That it has done so is manifest, and the only other point to which I desire to draw the attention of the profession is, to have recourse to the surgical means somewhat earlier in the progress of the case than has hitherto been done. When remedial measures have failed, and when the disease is still extending, then the surgeon should interfere before the strength has been reduced by the ineffectual struggles of the patient to obtain air through the obstructed air-passage. The following cases are illustrations of the results of tracheotomy in diphtheria:—

Case XVI.—On the 1st February, 1864, Dr. Chalmers requested me to visit, with him, the child of Mr. ——, a little girl, aged 5½ years. She had been ailing about a week, but Dr.

Chalmers had not been called till four days after the onset of the disease, when he found her suffering from diphtheria. Mustard was applied to the throat and back, and ipecacuan wine administered. The disease, however, continued to progress, and on the day named I found her in great distress from obstructed respiration. The exudation had evidently extended into the larynx. I at once performed tracheotomy, and gave her instant relief. She bore the tube very well, and rested well at night. Next day she took beef tea and milk, and was much better. She continued to improve for four days, when, as the tube seemed to give her some annoyance, I removed it, and left her breathing quietly. During the night, however, a severe fit of choking came on, and she had difficulty in breathing, for a considerable time. On the fifth day the respiration became more obstructed, and she was wearied out, and died at mid-day.

Case XVII.—T. C., aged 6 years, was seized with symptoms of diphtheria on the 7th of February, 1864. Patches of white exudation were visible on the tonsils and fauces. He was treated, under Dr. Drummond, by inhalation of steam, application of hot fomentations, and by the administration of chlorate of potash. On the 11th, the disease had extended to the larynx, and the patient was then placed under my care. He was removed to a private room in the Infirmary, in order that he might be under the immediate care of my assistant and dressers. On admission, at 2 p.m., the respiration was hurried, difficult, and stridulous; the face flushed; pulse 120, full. As his strength was good I ordered an emetic of ipecacuanha, to be followed by repeated doses of iodide of potassium. At 6 p.m. the breathing was more impeded, but the pulse was still good. The emetic was repeated. At 9 p.m., the dyspnœa was so urgent, and the spasmodic stridor so much increased, that the face became almost livid; and in a paroxysm the patient sprang out of bed and appeared on the point of suffocation. I at once decided on performing tracheotomy. The operation was accomplished with great difficulty, owing to struggles and the occurrence of several spasms. The neck was very vascular, and there was considerable hæmorrhage from a distended skin, which I secured before opening the trachea. The tube, however, was safely introduced, when the struggles at once ceased, and the breathing became tranquil. A large quantity of tough exudation was coughed up, and pulled out of the wound, after which the air-passage seemed completely clear of obstruction.

On the 12th and 13th he was remarkably well, but on the 14th he was feverish, with a white tongue and rapid pulse. On the 15th his skin was covered with a bright eruption of scarlatina; but he was more comfortable since the eruption appeared. On the 17th he was progressing favourably; and as all uneasiness

connected with the tube had gone off, the latter was removed without any bad consequences. On the 25th the wound was nearly closed, and the patient could speak and whistle. Next day he was allowed to go into the ward; but he caught cold, and general anasarca made its appearance. He was again confined to bed, and kept warm with plenty of blankets; and the heat of the room was raised. He got occasional doses of castor oil; and in a few days the anasarca began to disappear. On the 19th of March he was dismissed cured.

This case is peculiarly interesting from the occurrence of scarlatina and then anasarca to complicate the operation, and would lead one to believe that the existence of scarlatina, at least in a mild form, ought not to be considered a contra-indication to tracheotomy, if it should supervene upon an attack of croup or diphtheria.

Case XVIII.—W. R., aged 3 years, began to show signs of being ill for some days before medical assistance was called for. On the 18th March, 1864, Dr. Cassells was asked to attend, when he found the whole back part of the mouth covered with diphtheritic exudation. The treatment consisted in supporting the strength, and the use of chlorate of potash and dilute mineral acids. The patient continued to improve a little each day till the 22nd, when the larynx was evidently invaded. Treatment was continued for twenty-four hours longer; but on the evening of the 23rd the obstruction to respiration became so great that I was sent for. I found marked evidence of considerable laryngeal and tracheal effusion. The stridor was continuous, and the agony great; the face was cold, and the lips bluish. I at once performed tracheotomy, with the most marked relief to all the symptoms. The tube was introduced; and, as usual in these cases, the child fell asleep in half an hour after the operation. Every thing went on satisfactorily; so that on the evening of the 27th I removed the tube, and left him breathing quietly through the wound and mouth. Next morning he was quite well and lively, was playing about the bed, and took breakfast with great relish. About mid-day while running about the room, he said he felt he was choking, and became very pale. Dr. Cassells, who happened to be in the vicinity, was called at once, and on his arrival, found the child on the point of death. Indeed he died a minute afterwards. The wound seemed free from obstruction, and the exudation had altogether disappeared from the fauces. The cause of death was not ascertained.

Case XIX.—Esther W., aged 3¼ years, complained of sore throat on the 24th March. Dr. Greenlees, who was called, at once perceived it was a case of diphtheria, and treated it accordingly. The stages of the disease were so rapid, that by midnight the

larynx was affected, and, suffocation seeming imminent, I was sent for. By the time I arrived it was plain that there must be no delay, as the poor child was suffering severely. The pulse was not so strong as could be desired, and the face was cold and puffy; still it was so early in the disease I did not hesitate to perform tracheotomy. The relief was instant, and next morning the child was very well. There was at first some difficulty in getting her to take nourishment, this, however, was soon overcome, and she took milk, beef tea, and wine, with relish. Matters continued to go on nicely for five or six days, but, on the morning of the 31st, the breathing became more laboured, and the face got flushed—signs of fresh obstruction further down than the opening. I had retained the tube in the tracheal opening the whole time, fearing what had now occurred. By the evening the symptoms became more distressing; and the little patient died, worn out, on the seventh day after the operation.

Case XX.—On the 1st April, 1864, I was called to see E. T., aged two years. He had been attended by Dr. M'Millan since the 27th March. Iodide of potassium, in frequently repeated doses, had been prescribed, also emetics of ipecacuan. The symptoms amended for a few days, but on the 1st April it was evident that the exudation had extended into the larynx. When I saw the child it seemed to be suffering chiefly from the dyspnœa, but in the intervals of the paroxysms it was quiet, and rather weak. The duration of the disease was rather unfavourable to its strength, but, judging from the vigour with which he rose up and swallowed milk and other fluids, I determined to operate. The struggles of the boy during the operative procedure rendered it rather tedious, but nothing could be more gratifying to myself, as well as to the parents, than the perfect quiet which followed the introduction of the tube. The little patient got on nicely for four days; but on the morning of the fifth, it was evident that the symptoms were returning. Unable to stand against a renewal of the disease after the previous exhaustion, he gradually sunk, and died on the fifth day after the operation.

Case XXI.—On the 19th July, 1864, Dr. Renfrew requested my opinion in the case of A. M'D., aged $2\frac{1}{2}$ years, who had been suffering from diphtheria for a week previously. The child had been ailing for two or three days before Dr. Renfrew was called in. On the 17th it was evidently a case of well-marked diphtheria, but the exudation seemed at first confined to the fauces. Notwithstanding every care, and as faithful an application of remedies as could be obtained in so young a child, the disease continued to advance, and on the morning of the 19th the breathing became obstructed. When I saw the little girl she was suffering very markedly from laryngeal obstruction, the exudation having plainly

extended into the air-passages. The parents were informed of the imminency of the danger, and at once consented to the performance of the operation. As usual the lodgment of the tube in the trachea was the occasion of instant relief, and, before I left the house, the child was asleep, breathing quietly. Her progress to cure was uninterrupted. She rapidly got stronger, and could sit up and take food. I left the tube in till the seventh day, when I removed it without any trouble to the child. She made a rapid and perfect recovery.

I have performed tracheotomy twenty-one times, with the result of seven recoveries; and if it be remembered that the patients were all on the point of death from suffocation, it cannot but be regarded as an encouragement to the surgeon to endeavour to save life by operative interference in the later stages of this most fatal disease.

KS

OF KELIS.

, F.R.C.S. Eng.,
OF MILITARY SURGERY, ARMY
OOL.

o-Chirurgical Transactions,'
and Chirurgical Society of

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1. Standing Posture. **2.** Sitting Posture. **3.** Posterior view of Tumour.

4. Clamp applied to the neck of swelling before the operation.

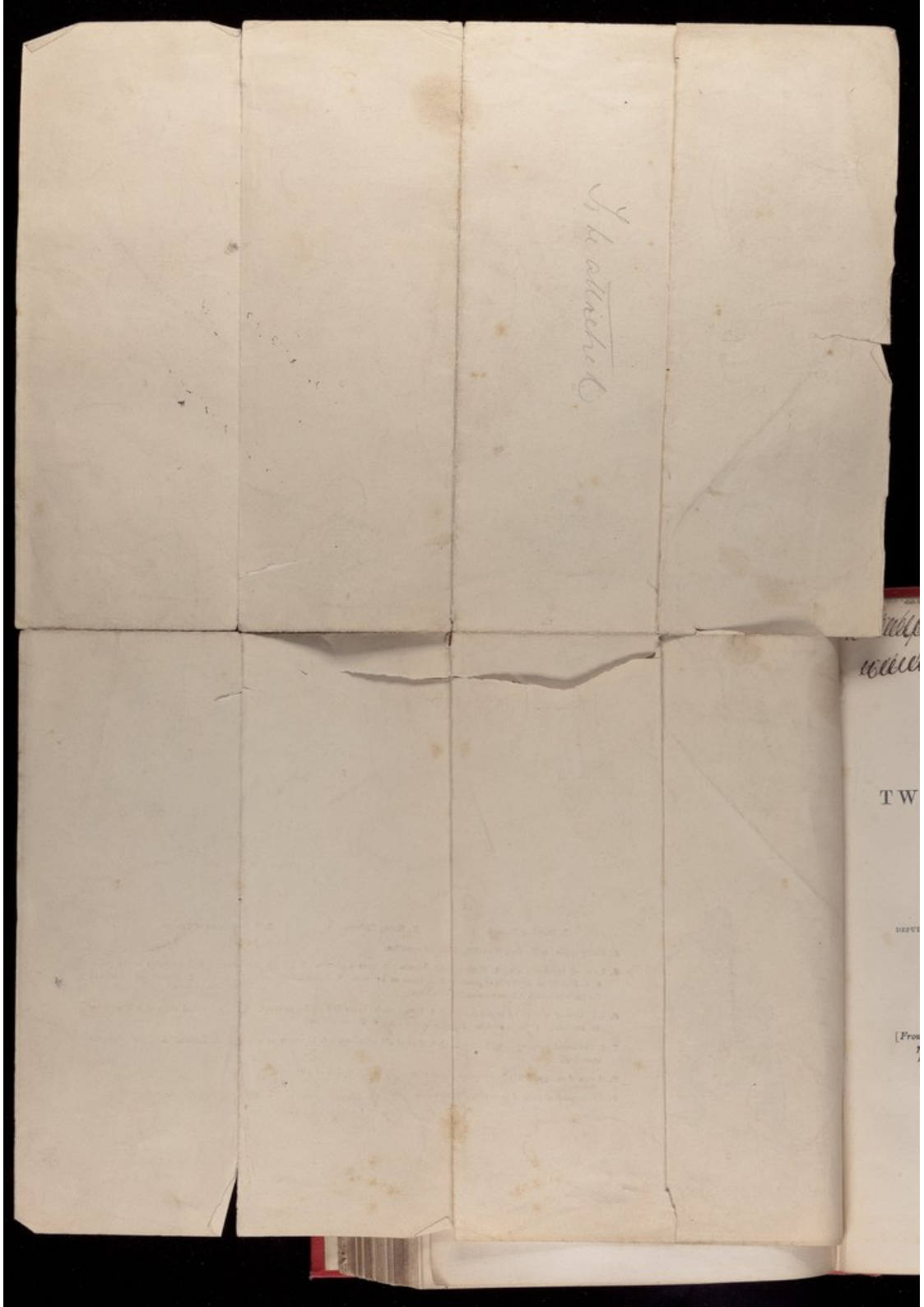
5. Lines of Incisions; viz., 1. Slitting up of prepuce. 2. Corona glandis. 3. Incision from above symphysis pubis to the penis. 4, 4. Incision on right side of growth. 5, 5. Same on left side. 6. Nodulated appearance of prepuce. 7. Circular incision around the penis to detach it from surrounding structures.

6. 1, 1. Line of incision by transfixion. 2, 2, 2. Parts included in the first portion removed. 3. Penis dissected out, and held aside by an assistant. 4. Right testicle. 5. Large hernial sac. 6. Contents of sac.

7. 1. Peritoneal covering. 2. Intestine. 3, 3. Seat of old adhesions. 4. Ligatures to opening. 5. Testicle. 6. Penis (after the operation).

8. A case of an Egyptian recently operated upon successfully by Dr. Ogilvie of Alexandria.

9. Appearances of parts of same man after operation.



REMARKS

ON

TWO CASES OF KELIS.

BY

THOMAS LONGMORE, F.R.C.S. Eng.,

DEPUTY INSPECTOR-GENERAL; PROFESSOR OF MILITARY SURGERY, ARMY MEDICAL SCHOOL.

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1863.

REMARKS

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TWO CASES OF KELIS.

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THOMAS LONGMORE, F.R.C.S. Eng.,

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Received Jan. 9th.—Read Feb. 24th, 1863.

In the thirty-seventh volume of the 'Transactions of the Royal Medical and Chirurgical Society,' there is a paper by the late Dr. Addison, on the "Keloid of Alibert," and on the form of kelis which that distinguished physician considered to be of a distinct character, and which he designated "true keloid."

Within a short period two cases of kelis have come under my care, at Fort Pitt, Chatham; the one presenting the appearance of the fibrous tumour classed by Dr. Addison as the "keloid of Alibert," the other offering so very striking an example of what he described to be "true keloid," that I have thought some brief reports of these cases of this rare disease, with the accompanying drawings and casts, might be of interest to the Fellows of the Society.

The first case which I have to notice answers the description of the "keloid of Alibert," or rather of that form to which Alibert, as Dr. Addison mentions, himself applied the term "spurious or false keloid," in consequence of the disease being developed upon a cicatrix, and not appearing

spontaneously. Among other exciting causes incidentally mentioned in the paper by Dr. Addison, is the cicatrix resulting from the infliction of the punishment of flogging. This case presents an example of the disease following that exciting cause; but, at the same time, the very slight nature of the punishment in this instance, and the appearance of spots of a similarly diseased character in other parts of the body, sufficiently attested the fact of a pre-existing constitutional tendency to the affection.

The following is the history of the case referred to:

Private J. E—, 41st Regiment, æt. 24, born in Shropshire, employed previous to enlistment as a labourer, a man of good health, though of rather intemperate habits, was flogged at Devonport, on the 19th of September, 1859, for disgraceful conduct, and received fifty lashes. He received nearly the whole of the lashes on one spot, namely, upon the skin over the supra-spinous fossa on the left side. Staff-surgeon Donald writes—"The corporal punishment inflicted on Private John E— was light, and there was very little laceration of the skin." He was nearly one month in hospital after the flogging, but was chiefly under treatment for "gonorrhœa." He then went to duty, but when he carried his pack the pressure of the cross-belts against the cicatrix caused itching and uneasiness. About three months after the punishment, during two months of which period he had been wearing his belts and pack, he first noticed a growth from the cicatrix, which gradually increased from the size and shape of a small, round tubercule, to a large, flat mass, nearly as large as a man's hand. There was not any amount of pain from this growth during its formation. He states that none of his family were subject to tumours of any kind, to his knowledge.

Condition noted on his admission at Fort Pitt, on the 22nd of June, 1861:—"He is a very tall man, of strong-looking frame. On the left shoulder, commencing about an inch from the spine, and covering the whole of the supra-spinous fossa, is a flat tumour, or elevated patch of

hypertrophied tissue, about the size of the palm of the hand. It was upon this situation that the man received the flogging. The mass in its longest diameter is five inches, and its greatest breadth is three and a half inches. Its thickness seems to be about one inch. The tumour is of a flesh colour, pinker than the skin, particularly smooth to the touch, although marked by small pits, and puckered by several deep, furrow-like depressions, from the bottom of which a few hairs spring. The circumferential margin of the patch is irregular in outline, from being deeply indented at various points. On the front of the patient's chest are several very small tumours, evidently of the same nature; these first appeared as small spots of acne, but he cannot remember the date of their first appearance.

"He says he never had syphilis.

"The tumour is irritable and tender if subjected to continual pressure, the tenderness, however, not amounting to actual pain; it is also sensibly affected by the occurrence of damp, and other changes of weather.

"Its appearance on the breast, as well as on the back, shows such a tendency to the development of the disease, that operative interference is considered inadmissible."

This patient was manifestly unfit for service as a soldier, from being unable to wear his belts or carry a knapsack, and was, therefore, discharged as an invalid. He proceeded to Leominster, as his place of residence.

It may be worthy of mention that Professor Maclean informs me that two cases of kelis have come under his notice, in each of which the disease had its origin in flogging. One of these occurred in a young soldier of the 18th Regiment, of which Dr. Maclean was then in medical charge; the other in the 55th Regiment. These cases occurred in China in 1841-42.

The disease in the next case is much more extensive in character, and is the one which answers to that form of kelis which Dr. Addison sought to separate from the

former variety, under the name of "true keloid." The drawings and photographs sufficiently indicate the appearances of the disease, and I proceed at once to give the history of the case.

Private Robert McF—, 2nd Dragoon Guards, æt. 43, a man of spare but muscular habit, was admitted at Fort Pitt on the 29th May, 1862, to be invalided from the army, on account of a disease of the skin, which appeared in India, and was at first mistaken for a form of leprosy. The patient states that previous to enlistment, in the year 1839, his occupation was that of a blacksmith, and that since he joined the service he has performed the duties of farrier in his regiment. He has always enjoyed good health, with the exception of an attack of typhus in 1838, and the contraction of a venereal sore in 1841. The sore, he mentions, was never followed by secondary symptoms, nor does it appear from the medical records that he has ever suffered from a constitutional syphilitic taint.

Private McF— landed in India, in November, 1857, and states that for the first five months he did not suffer from prickly heat (lichen tropicus), but at the expiration of that time began to suffer from it. While in cantonment at Meerut, in May, 1858, and after having suffered in common with all the other men of the regiment from the usual symptoms of prickly heat for about a month, the present disease first made its appearance. It began as a few prominent, red tubercles, on the right forearm. It next appeared over the middle of the sternum, a situation which appears to be, from the statements of most observers, its "seat of election." From thence it extended in a gradual manner towards the two sides of the body. At the same time it appeared on the left shoulder and various parts of the back, and continued spreading until it had covered the entire dorsal surface, as shown in the photograph. The patches of hypertrophy appeared at first as small tubercles which, gradually increasing in size, and

meeting each other, coalesced into larger growths. These growths sent forth spur-like processes on every side, a slight puckering of the healthy skin, which surrounded the marginal limits of their bases, marking their progress. The spread of the disease was very slow and gradual; a period of two years elapsed before it had attained its present extent. His general health has never suffered in the smallest degree from the affection. The only annoyance he has endured in consequence of it has been the intense itching irritation which has accompanied it, more particularly when he has been warm in bed at night and in warm weather.

During the cool season in India he did not suffer from this distressing symptom, and he observed that if the cold weather lasted sufficiently long, not only did the pruritus cease, but the vivid redness of the keloid growths faded away. Even a partial disappearance of the growths would take place on continued cold, the prominences sinking, and leaving instead the peculiar old cicatrix-like condition which is visible in various directions.

None of his relatives had ever suffered from any similar affection, nor is he aware of any having died from cancer, or malignant disease of any form. There was no reason to suppose that the disease had been aggravated by intemperate habits.

Condition on admission at Fort Pitt, Chatham, 29th of May, 1862:—On examining the patient, whose general health appears to be excellent, the condition of the respiratory, circulatory, digestive, and excretory systems being all normal, we first notice in front some spots of kelis scattered over the upper extremities, and some bands stretching across the lower part of the chest. Behind, nearly the whole surface of the back, especially over the scapular regions, and a large portion of the surface of the loins, are covered with a network of this morbid growth, of the most striking appearance. The inferior extremities are quite free from the disease. The patient's face is covered by

small, rugose growths of the same character, interlaced in such a way that the depressions existing between them appear pitted, and closely resemble the marks left by variola. The part of the body which presents the keloid hypertrophy in the most marked aspect, the interlacing of the prominent fibrous ridges being most close, the depressions among them deepest, and the general resemblance to tightly drawn cicatrices strongest, is the left scapular region and its neighbourhood, including the posterior aspect of the shoulder. It is in this situation that the pressure of the cross-belt is chiefly exerted. In like manner, the part of the anterior aspect of the body which exhibits most of the keloid growths is that which is ordinarily subjected to the pressure of the waist-belt.

So much for the general position and characters of the disease; its more particular features, as noticed on closer observation, are as follows. It consists of excrescences, or rugged, cuticular folds, of various shapes, but generally appearing like oblong bands, joined together in such a way as to enclose within them spaces of a more or less oval outline. The folds rise abruptly from the cutaneous surface to a height averaging two or three lines. Their margins are observed to be generally more elevated than the intermediate portions. The skin covering the depressions enclosed within the keloid ridges presents to the eye the usual appearances of normal dermal tissue. The ridges themselves are of a uniform vivid-pink colour, but their surfaces are intersected by minute white lines. The florid pink line of the ridges terminates with their circumferential margins; a distinct line of demarcation, so far as colour is concerned, exists between their bases and the surface of the adjoining skin. Pressure causes the redness to disappear temporarily. In addition to the keloid folds just described, there are scattered over the integumentary surfaces numerous thin, shining, corrugated patches, closely resembling the cicatrices left by burns. These appearances mark the situations where bands of the pink kelis formerly

existed, but which have gradually lost their active character, and subsided into these apparently permanent cicatricial-like residues.

When examined by touch, the keloid bands, on laying hold of them laterally and slightly raising them, are felt to be firm and elastic, and have apparently a fibro-cartilaginous consistence; on the other hand, when passing the fingers over their surfaces, the sensation given is that of velvety smoothness. The facility with which they can be moved to either side, and with which they are seen to participate in the motions of the skin, prove that they have no deep-seated connexions. They convey the idea of being thickened hypertrophied folds of dermis, distinct from the areolar tissue lying beneath. The pressure made in the examination by the fingers does not appear to cause any abnormal sensation of pain or tenderness; sensibility of the surface is, however, perfect. The growth has never caused pain, apart from the irritation and itching which have always been present in hot weather. The muscular movements of the body have never been impeded by its development.

The patient complains of more or less sensation of heat in the parts of the cutaneous surface marked by the disease, and on placing the hand upon these parts a certain increase of temperature is perceptible. A sensitive thermometer, which, when placed under the tongue, rose to 97° Fahr., and in the axilla to 94·5° Fahr., indicated 91° Fahr. as the mean temperature of the diseased surface, while that of the normal portions of the integuments was only 89·5° Fahr. The function of perspiration does not seem to be impaired; the surfaces of the keloid ridges are perceived to be as moist as those of the sound skin.

When the disease is observed with an ordinary magnifying glass, the prominences present nothing peculiar. They have a highly vascular appearance, and are intersected by minute, white, fibrous-looking lines.

The chief features of the disease in this case having been described, it remains only to say that various remedies, both constitutional and local, were tried without producing any

marked effect upon the disorder. Constant attention to cleanliness, so as to prevent accumulation of sebaceous secretion or dirt in the depressed interspaces, and the application of cooling lotions, allayed the irritation which accompanied the disorder, especially when the atmospheric temperature was elevated, but nothing appeared to exert any influence either in checking the spread or promoting the absorption of the characteristic keloid growths. The patient was discharged as a pensioner from the army, and proceeded to reside in Glasgow at the end of June last (1862).

Remarks.—The description of the two cases has been given so fully that very little more remains to be said. The peculiar characters of "kelis," as first described by Alibert, were so strongly marked in these two instances, that it was impossible to confound the disease with any other cutaneous affection; and one is at a loss to understand how its existence as a distinct malady could have been ignored by Bateman, and other authorities. But whether the genus "keloid" offers characters distinct and varied enough to warrant its division into two species—the first, "true keloid;" the second, "keloid of Alibert" (false or spurious keloid)—is a subject which fairly admits, I think, of discussion. No two more striking examples of the two species, if they be admitted to be distinct species, could be found than the cases I have brought to the notice of the Society. The larger, flattened, isolated tumour, in the one case, following the irritation of flogging, forms at first view a remarkable contrast with the cicatrix-like bands and depressions dispersed so extensively through the dermal structure in the other. But do not the two cases present evidences of their being simple varieties of the same disease, dependent upon the same keloid constitution, if I may so express it, of the dermal tissue, their different features depending solely upon the differences in the exciting causes? It appears to me that there are evidences of such

varieties; and that the keloid constitution,[1] whatever that may be, existed in the patient in whom the disease was excited by the flogging, is rendered manifest by the slightness of the punishment in the first instance; by its non-development until a considerable period (nearly three months) after the immediate effects of the punishment had been healed; but more particularly by the small keloid spots in the favourite habitat of this affection, viz., the skin covering the anterior part of the chest. The term "spurious keloid" would scarcely be justifiable in such a case. It is equally evident that in the second case a similar constitutional tendency existed; for of all the men of the Queen's troops then in India, and subjected to the same solar influences, the disease was developed in him alone. Had there been any other instance, the subject of it would have equally had to be invalided from the army. The extensively diffused character of the keloid affection in this latter case was probably due to the equally diffused irritation of the "lichen tropicus" to which the man was subjected. It is curious that two cases of "kelis" after flogging should have happened to fall to the notice of my colleague, Professor Maclean; as I have in vain searched for any other example of the disease among the records for several years past of the invaliding hospital at "Fort Pitt" than the one I have just described.

It will not escape notice that the "lichen tropicus" which preceded the appearance of the kelis in the soldier who was invalided from India, is a feature which corresponds very

[1] Dr. W. J. Burnett, of Boston, has recorded an instance in which the disease seemed to descend from a father to his children ('American Journal of Medical Science,' new series, xxvi, p. 370, quoted by Dr. Wood). Dr. Wood regards the keloid growths occasionally developed in the cicatrices of ordinary ulcers, not as a spurious keloid, but as a true keloid growing thus in a person constitutionally predisposed (Wood's 'Principles and Practice of Medicine,' vol. ii, p. 457). Dr. Bennett gives an instance of keloid growths in the cicatrices of *syphilitic* rupia ('Principles and Practice of Medicine,' p. 950). In this case, had the cicatrices resulted from any other cause, it is only reasonable to suppose they would have been equally followed by kelis.

closely with the pricking and itching sensations described as an accompaniment of the disease from its onset, by some of the patients in whom the disease has been developed in our own country.

There is one point which seems worthy of notice, as bearing on the subject of treatment. Mr. Erasmus Wilson mentions that in a case which he brought to the notice of the late Mr. Key, gradual pressure was recommended as a mode of treatment, with a view to promote absorption, and that it proved fruitless.[1]

Dr. Rayer had recommended the same remedy. In the first case which I have brought to the notice of the Society, it would appear as if the pressure of the leathern belt, after the return of the man who had been flogged to his ordinary duty, was one cause which assisted in the development of the keloid tumour. In the second case also, the radiciform processes were most prominent and closest together in the neighbourhood of the left shoulder, where the pressure of the belt was chiefly exerted. These observations would be further arguments against resorting to pressure as means of cure. The proper mode of treatment is still a desideratum. None of the remedies employed in the two cases detailed appeared to exert any beneficial influence. Alibert relates that in the cases in which extirpation by the knife or destruction by caustic appliances have been resorted to, the operations have wholly failed; and it appears to me that such a result might be anticipated from studying the nature of the malady and its causes.

A stereoscopic photograph of the keloid growth in the case of Edwards is preserved in the collection of the Society.

[1] 'Portraits of Diseases of the Skin,' 1855, by Erasmus Wilson, F.R.S. ("Kelis.")

DESCRIPTION OF PLATE IV.

The case of Private Robert Macfarlane, 2nd Dragoon Guards.

Fig. 1.—The keloid disease as it appeared upon the left humeral and scapular regions.

Fig 2.—The keloid growths in the same case, as they appeared upon the chest and epigastric region.

Med. Chir. Trans. Vol. XLVI.

Plate IV.

CLINICAL SURGERY.

THE

INJURIES AND DISEASES

OF THE

NERVOUS SYSTEM.

BY

THOMAS BRYANT, F.R.C.S.,

ASSISTANT-SURGEON AND LECTURER UPON OPERATIVE SURGERY AT GUY'S HOSPITAL.

PART I.

LONDON:
JOHN CHURCHILL, NEW BURLINGTON STREET.
MDCCCLX.

THE

INJURIES AND DISEASES

OF THE

NERVOUS SYSTEM.

INTRODUCTION.

The illustration of disease and of the results of injuries by the quotation of cases has always been a favorite method of imparting knowledge, and the careful study of these examples is a method equally valuable as a means of acquiring it; for by giving the material from which facts and principles are deduced, the author and his readers are placed upon a par, and the latter are enabled to verify the truth of the former's opinions.

With that view, it is my intention, in a series of papers, to illustrate the surgery of the different regions of the body, to give cases and facts deduced from them to support any opinion I may express, and thus to make my readers thoroughly able to understand the principles which have guided the surgeons of a large metropolitan hospital in their practice, and to show that this practice is based upon scientific and pathological inquiries.

These papers will be published in different parts, and the present (Part I) will include the injuries to the skull and spine, with their contents, briefly noticing also some of the diseases. The cases quoted have all been under personal observation, and have taken place within the last five years, in my own practice and that of my colleagues. They are taken

from my own notes, although to my colleague, Dr. Wilks, I have been indebted for many of the particulars of the post-mortem appearances.

It will be quite impossible to illustrate every point which the surgery of the different regions may present; but I trust that nothing which is practical will be omitted, and that the pathology of the diseases and injuries will be so represented as to indicate the basis of a scientific practice.

It will be my aim to illustrate the principal injuries which may take place, to give examples of each form, and to point out the symptoms by which each may be distinguished; to indicate by cases the complications which are generally found, and the pathological conditions and symptoms with which these complications are connected; and, lastly, the principles of treatment will receive attention, and the practice which should be employed in the various conditions illustrated by the quotation of examples.

Where numbers are of value in the support of any line of practice or any pathological fact, they will be given, and the whole source from which this material is drawn will be found tabulated in an ensuing page.

The brief consideration of scalp wounds will first claim our attention, and then we shall proceed to the more serious subject of concussion of the brain, fracture of the skull, and encephalic injuries.

How far I have succeeded it must be for my readers to determine, but I believe that few material points have been left unnoticed, and that this part embraces the whole clinical surgery of the region to which it is confined.

Upon future occasions the surgery of other regions of the human frame will be illustrated in a like manner, and it is hoped that, when completed, the whole will form a Clinical Surgery which will be found not only useful as a guide to the student, but also as a book of reference to the practitioner.

Wellington Street, London Bridge;
January, 1860.

Table of the Injuries and Diseases of the Nervous System admitted into Guy's Hospital from October 1st, 1853, to January 1st, 1859.

	Cured.	Relieved.	Died.	Total.
Scalp-wounds	116	—	—	116
Concussion of the brain—simple	56	—	—	56
" " complicated	24	—	2	26
Fracture of the vault of skull	12	—	31	43
" " base	12	—	18	30
Apoplexy with injury	—	—	4	4
Concussion of the spine	22	—	—	22
Dislocation of the spine	—	—	6	6
Fracture and dislocation	—	3	15	18
Lateral curvature of spine	—	5	—	5
Diseased spine—cervical	—	15	—	15
" " dorsal and lumbar	—	19	—	19
Spinal abscess—cervical	—	1	—	1
" psoas	—	22	3	25
" lumbar	—	18	2	20
" gluteal	—	1	1	2
Spinal paralysis	—	11	6	17
Total	242	95	88	425

Scalp-wounds.

Amongst the 120 examples admitted into the hospital were 116 cases of a simple character and uncomplicated, although tolerably extensive. They were all treated by sutures, strapping, pads of lint, or warm-water dressing; in no one instance did a bad symptom follow, and in all a good recovery took place. In some instances hæmorrhage was present, checked by the application of a ligature to the bleeding vessel, cold water, and pressure.

Two cases only were followed by erysipelas, successfully treated with iron and stimulants, the application of flour to the head being the only local remedy.

One was followed by suppuration beneath the scalp, and the subsequent exfoliation of a small piece of bone upon the fiftieth day, and a speedy cure.

In one instance, of a boy, æt. 10, of a pale cachectic aspect,

the hæmorrhagic tendency was associated with the injury. After a small scalp-wound, received four days before his admission, constant bleeding had taken place. All pressure by pads, &c., had failed, and the only successful remedy was the application of a styptic in the form of the perchloride of iron; iron was also given internally, and a good recovery ensued.

This patient had always experienced the same hæmorrhagic tendency after the receipt of any wound, and he had also a sister with the same disposition.

From the preceding analysis it would appear that scalp-wounds, as a rule, have a tendency to do well; that the complication of erysipelas, which has been regarded as a frequent one, is by no means so; and that when it takes place it has not a very injurious tendency.

That exfoliation of bone may occasionally follow an injury to the scalp; and that the *treatment* of scalp-wounds should be as simple as possible.

When the wound is a small one, and the edges gape to any extent, the application of a small strip of adhesive plaster, just sufficient to bring the edges of the wound together, is the best treatment, and a soft pad of lint subsequently applied, so as to afford gentle pressure.

When the edges are fairly in apposition, a simple pad is all that is necessary, or perhaps only a piece of wet lint.

But when the wound is an extensive one, and the scalp is separated from the bones beneath, sutures must be applied, the wound having been previously thoroughly cleansed from all foreign bodies, and the edges well adapted.

Strapping between the sutures may be required to maintain the edges together, but the wound should not be covered in by any plaster; a pad of lint may then be adjusted, but if the soft parts are much injured, a simple layer of lint or linen kept moist is to be preferred.

Under this treatment the wounds generally do well. The patient should be kept at rest as much as possible, especially if the wound be very extensive; an occasional purgative may be required, and moderate diet allowed.

CHAPTER I.

CONCUSSION OF THE BRAIN.

Any uneducated person, upon handling a skull and examining closely its interior, would be struck with the strange irregularity of its base, and with its numerous prominent and projecting processes. If he were then to examine and handle the brain itself, and to see of what soft and easily lacerable material this important organ was composed, he would not be surprised that any sudden shake or jar, any blow or injury, however slight, would, as a necessary consequence, be followed by some interference with the delicate functions of this most delicate of structures, if it did not produce some mechanical injury to the brain itself.

Anatomists and surgeons are well aware with what care nature has protected the nervous ganglia, how carefully the brain is guarded from external injury, and how beautifully it is suspended, or rather floated, upon its "water-bed." Numerous indeed are the other points which might be indicated, denoting the same forethought, and all directed to the same end; and although this end is generally attained, and the brain is, as a rule, so well guarded that it requires some considerable force to injure it from without, and an equivalent to produce an injury from within, still the practical surgeon is too frequently called upon to witness cases where the functions of the brain are, for a time, considerably interfered with, if not arrested, and where, from mechanical force applied externally, the centres themselves are more or less injured.

The subject of concussion will first claim our attention, and will be discussed in the following chapter.

Concussion of the brain may be considered under different heads, a division of the subject being necessary, as the same injury may be followed by different results.

In some cases an interruption only to the functions of the brain may be produced, although this interruption may be for a short or long duration; in some instances the functions of the brain will be totally suspended, and this suspension will vary in different cases.

At times a fatal termination will take place, and some mechanical injury to the nervous centres themselves will then generally be found.

I propose, therefore, to consider the subject of concussion of the brain under two heads:

1st. *The simple form*, where an interruption only of the functions of the organ follows the injury.

2d. *The complicated form*, where the brain itself is injured, and associated with extravasation of blood, either upon or within its structure.

Section I.

Under the heading of "simple concussion" of the brain I include those cases only which are characterised by some temporary interruption or suspension of its functions, and which, by rest and the lapse of variable periods of time, are restored to their natural condition.

I have fifty-six examples of this description, in eight of which a scalp-wound existed; in all, the functions of the brain were more or less suspended, as indicated by loss of consciousness and the power of motion; by rest, the application of cold to the head, warmth to the feet, and, in some few instances, the administration of a mild purgative, perfect recovery ensued.

In many instances, however, the case is more complicated; the accident is immediately followed by some complication, such as hæmorrhage from the nose or ears, or, more remotely, by signs of increased action or inflammation of the cerebral membranes; and from my notes of twenty-six examples of this description I propose to extract such cases as will illustrate the subject, giving them as briefly as will be consistent with clearness, and as may be sufficient for the purpose intended.

In the simplest form of concussion of the brain a patient receives a blow or injury which produces some severe shaking of the cranial contents, and this shaking is followed by a loss of consciousness more or less perfect, and also a loss of all power of motion. If the patient is seen at this time, the skin will be cold, and the features more or less contracted, the pulse will be slow and intermittent, the pupils very variable,

in some cases dilated, in others contracted, and, in a third class, one will be dilated and the other contracted.

If the patient is watched, and the case is not one of great severity, after a variable period there will be signs of movement; he will perhaps move a limb, in an impatient and objectless manner; if he is spoken to with a loud voice, he will perhaps show some evident signs of returning consciousness, either by making some inarticulate noise, or by merely opening his eyes, and again returning to his stolid condition.

If the case is still carefully observed, the mode of respiration may become altered; from being slow and labouring, it will be irregular, and perhaps sighing.

After a time, other signs of what are termed reaction will make their appearance—the skin will become warmer and more natural, the shrunken and contracted features will return to their former condition, the pulse will be felt more regular and more rapid, and, what is very frequent, vomiting may appear. This symptom is one of value, it generally shows itself upon the first appearance of what is called reaction, and is apparently the first result of a more active circulation through the cerebral centres. If all goes on well, the patient rapidly recovers, and returns to his natural condition, feeling perhaps for a few days somewhat heavy and drowsy, and indisposed for any bodily and much less mental labour.

In this brief sketch of an ordinary and uncomplicated example of concussion of the brain the symptoms are very marked, and are not associated with any complications, either primarily or after the period of reaction has taken place. In the following examples, however, some such occurred, and I shall at present bring forward only specimens of the primary.

The first examples will be those where the accident was followed by hæmorrhage from the nose, ears, or into the eyelids.

Case I.—Epistaxis and Hæmorrhage into Eyelids.

E. P—, a boy, æt. 13, fell off a ladder twenty-five feet, the fall rendering him perfectly unconscious and motionless. He was admitted shortly afterwards in this condition, with *ecchymosis into the lids of both eyes*, and also with *epistaxis* from the right nostril; in about eight hours reaction appeared,

with vomiting, consciousness then returned, and he rapidly convalesced.

Case II.—Hæmorrhage from the Ear, and Excess of Reaction.

A man, æt. 38, having been thrown from his cart upon his head, was admitted in a partially unconscious and paralytic condition, with a cold skin and labouring pulse, and also with *profuse hæmorrhage* from the left ear. It commenced immediately after the injury, and continued for about three hours. Reaction rapidly appeared, and upon the fourth day the man complained of intense pain shooting through his head and general drowsiness; there were symptoms of feverish excitement and a very anxious expression. A blister was applied to the neck, and one grain of calomel given every four hours; upon the third day all pain had ceased, fever had subsided, and a natural expression had returned; and after two weeks he left well, with the hearing perfectly sound.

The two cases just quoted are not uncommon examples of concussion, as hæmorrhage from the nose and ears are frequent associates of such an injury; but in all such instances the hæmorrhage will be limited. When the nose is the outlet through which blood escapes, the bleeding, as a rule, appears directly after the receipt of the injury, and soon ceases; when the ear is the source of bleeding, it may continue for some few hours and then subside, but it is never followed by the clear serous discharge which is found in cases of fractured bone. It is true that some thin semipurulent discharge may follow upon a discharge of blood, but this probably takes place merely from the coagulation of some blood within the external auditory passage, and its subsequent softening down.

When hæmorrhage takes place into the eyelids, it may be the result of a direct blow, but it is frequently produced by the concussion; the blood, however, will be confined to the eyelids, and will not appear as a subconjunctival ecchymosis, as is seen in fracture of the base through the orbital plates.

We will now pass on, and quote some few cases illustrating the condition of cerebral disturbance which follows upon the accident. In the simplest examples, as previously stated, the

patient, after the receipt of the injury, becomes either totally or partially unconscious, and, after a variable period, gradually or rapidly regains his natural condition; but in the instances I am about to quote, after a partial return of consciousness, there was a relapse, and the patient returned to his insensible condition. This condition will be denominated a "relapsing unconsciousness," as adequately expressing the exact condition of affairs. It is not a dangerous condition, nor does it appear to indicate any definite complication, but it is a point worthy of observation, as it might lead the surgeon to believe in the existence of some more serious encephalic injury.

Case III.—Concussion of the Brain; Relapsing Unconsciousness.

A boy, æt. 9, when sliding, fell upon his face and struck his forehead with some force; the accident was followed by complete insensibility and inability to move; he remained in this condition for about fifteen minutes, and when brought to the hospital was partially sensible, and could answer questions, complaining of pain over the injured front. He was put to bed, and *gradually became perfectly insensible*, and his extremities, when lifted, fell powerless; in this condition he remained for an hour, and then showed symptoms of returning consciousness; he vomited severely, bringing up some blood, which had evidently been swallowed; a mercurial purge was given, and cold applied to the head; he remained heavy and drowsy for two days, when roused immediately returning to his sleepy condition, but left the hospital in ten days, cured.

Cases like the preceding are not uncommon, although perhaps they are not so well marked; the relapsing unconsciousness would appear to be produced by the earliest effects of reaction, the vessels yielding too freely to the heart's action, and thus producing a plethora of the part, which induces a comatose or semi-comatose condition. The following case would tend to prove the correctness of this opinion.

Case iv.—Concussion; Relapsing Unconsciousness; Epistaxis.

A boy, æt. 11, having received a blow upon the head from a falling piece of timber, became perfectly unconscious and quiescent; he remained in this state for fifteen minutes, and recovering, he walked home some short distance. He soon began to feel sick, and vomited, this vomiting being attended with *epistaxis*. He was then brought to the hospital, *with a cold skin and labouring pulse; he was very slightly conscious, refusing to answer any questions, and his limbs remained in the position in which they were placed. The pupils were dilated, but active.* He was left in bed, with the head raised, and cold lotion applied to it, and warmth to the feet, and he gradually recovered, leaving the hospital well ten days after admission.

Having given the complications which are frequently seen in cases of concussion of a simple character—that is, where no lesion of the brain has taken place—I will now proceed to discuss the subject of reaction, and to consider the symptoms and complications which may be found in such a condition.

In the case last quoted it appears probable that a return to a semi-unconscious condition may be produced by a simple reaction, and that epistaxis may also be a symptom of the same process. Vomiting has also been mentioned as an early accompaniment of the restoration of the circulation through the brain, and many cases might be quoted to illustrate the connexion. The following, however, will suffice.

Case v.—Concussion of Brain; Reaction, with Vomiting.

A boy, æt. 16, fell off a railway tender upon his head; he was picked up perfectly insensible and paralysed, and brought to Guy's. When admitted he was quite unconscious, and unable to move his limbs; the skin was cold, pulse slow, respiration laboured, and pupils irregular but active; in about an hour reaction showed its earliest symptoms by some mobility and vomiting, the skin also becoming warmer; from this moment he rapidly recovered.

The next complication which may be found associated with and produced by the process of reaction, after simple and uncomplicated concussion, is *convulsions*, and is well illustrated in the following cases.

Case vi.—Concussion; Reaction, with Vomiting and Convulsions.

A boy, æt. 15, having fallen from a height of fifteen feet backwards upon his head, was picked up perfectly insensible and paralysed; he was immediately brought to Guy's in this condition, and placed in bed. In about half an hour reaction appeared, accompanied with vomiting and convulsions, he then became partially sensible; for twenty-four hours afterwards he remained in a drowsy and confused condition, with dilated but active pupils, a quick pulse, and he vomited at intervals. A mercurial purge was given, and cold applications employed to the head, and a steady recovery ensued, without any bad symptom.

Case vii.—Concussion; Reaction and Convulsions.

A boy, æt. 9, having fallen from the height of twelve feet upon his head, was rendered completely insensible. He was admitted in this condition three hours after the accident; in a few hours he became violently convulsed (as an epileptic), and remained so for one hour and a half. His breathing became stertorous, and he vomited; he then fell into a deep sleep, and awoke sensible; the head was shaved, and four grains of calomel administered. The following day he was drowsy, although sensible; the pupils were active but irregular; pulse hard, and 84. Two grains of gray powder and three of Dover's powder were given twice a day. Upon the next day, the third after the accident, he became perfectly natural; he was kept quiet, and the mercurial was continued with the best effects, the boy leaving the hospital cured fourteen days after his admission.

The two cases just given are sufficient to prove the connexion between reaction and convulsions; the latter could

hardly have been produced by any inflammatory or other cerebral injury, as other symptoms would have accompanied it, and the steady and rapid convalescence of both patients forbids the idea of any such complication.

I shall now pass on to consider other complications, and to illustrate them by an example of each kind. Some pain in the head after concussion is generally present, but in some instances it is of a very severe character.

Case viii. — Relapsing Unconsciousness; Reaction, attended with acute Pain in the Head.

A boy, æt. 15, fell off a scaffold upon his head, a distance of twelve feet; he was taken up quite unconscious, and unable to move, and admitted into Guy's in such a condition. After a few hours' rest in bed he began to show signs of animation, but speedily relapsed. In about twelve hours he became sensible, and complained of *most intense pain through his head;* this was shaved, and cold lotions applied, a purgative was also administered; in another twelve hours this pain had left him, and he rapidly convalesced.

The next complication is of simple delirium occurring when reaction was established, and then rapidly subsiding. It can be illustrated by the following case.

Case ix.—Concussion, Reaction, and Delirium.

A man, æt. 35, who received a blow upon the head, causing a scalp-wound and partial insensibility, was admitted into the hospital with cold skin, labouring pulse, and slow breathing; he soon, however, became perfectly conscious, but also *delirious.* His skin became hot and pulse quick. The gray powder and Dover's powder were given three times a day in three-grain doses, and after twenty-four hours all bad symptoms had disappeared; recovery was retarded by an attack of erysipelas, but he left the hospital cured in six weeks.

Having thus illustrated the subject of concussion by simple

cases, and others associated both during their primary stage and also during the stage of reaction with certain complications, we pass on to the consideration of others, in which the stage of reaction has been somewhat excessive, and has been accompanied by complications of a different character, being evidently produced by some inflammatory action.

In Case ii, already quoted, reaction had been evidently in excess, producing symptoms of some slight inflammatory action; treatment, however, fortunately proved of value, and checked its course.

In the following example a slight concussion of the brain was followed by inflammatory symptoms, causing squinting, which, however, was cured by treatment.

Case x.—Concussion; Strabismus.

A man, æt. 26, having been struck down by a bag of sugar falling from a height upon his shoulders was rendered almost completely unconscious; within a few minutes consciousness partially returned, and he vomited freely. In this condition he was admitted into Guy's Hospital, being drowsy and roused with difficulty; in a few hours he became quite sensible, and complained of pain in the head; he was kept in bed, and cold lotions were applied to the seat of pain, and a mercurial purge administered. The pain, however, continued very intense, associated with a hot skin and contracted pupils, and upon the fourth day a *convergent squint* of the right eye was very marked. Gray powder and Dover's powder, in three-grain doses, were given three times a day, and in three days all these symptoms were much diminished, the fever was less, pupils less contracted, and the eyes were more tolerant of light; the strabismus also was improved. In another three days the squint, with all bad symptoms, had disappeared, and after a few weeks' residence in the hospital he left cured.

This secondary inflammatory action may, however, be more acute, and give rise to all the symptoms which an inflammation of the cerebral membranes is wont to produce.

Section II.

Concussion of the Brain, complicated with some lesion of its structure or extravasation of blood.

Although there may be some difference of opinion amongst physiologists as to the question whether an alteration in the functions of a part necessarily involves any change of its structure, I think there can be none amongst surgeons or pathologists as to the fact, that in all cases of injury to the nervous centres, producing a suspension or alterations of their normal action, there is and must be some change or injury to the structure of the brain or spinal cord, although that change may be overlooked by the naked eye.

When we consider the delicacy of the structure of the nervous ganglia, and how little we even now know of the distribution of its fibres, or of their anatomical arrangement, it is not to be wondered at that the acutest pathological eye may at times be baffled in discovering any abnormal change, when the normal is not yet understood.

As the science of pathology advances, and the eye of the student learns how to observe, and what to look for, alterations of structure are observed which our ancestors never dreamt of, and which consequently would have been passed over. In cases of death from concussion of the brain there can be no doubt this mistake has often been made, and the cases are not rare, as described by authors, where death followed upon concussion of the brain, but no lesion of its structure had been detected.

I am not disposed to dispute the value of their observations, or to doubt the truthfulness of their descriptions, but I do believe that such cases are of exceeding rarity, if they occur at all; and that some change in the brain itself, or upon its surface, will generally be found if earnestly looked for. There will be some extravasation of blood, either upon its surface or within it; if upon its surface, it will be either upon or within the membranes, or within the meshes of the pia mater; and if the latter, some ecchymosis of the cerebral convolutions will generally be present. If the extravasation of blood takes

place within the structure of the brain, the clot will seldom be —as in an apoplexy—in one large mass, but it will generally show itself in small and numerous patches, varying from a pin's head to a pea in size.

I will now proceed to quote briefly some illustrations of these points, and will commence by quoting an example of concussion followed by ecchymosis of the brain.

Case xi.—Concussion and Ecchymosis of the Brain, both upon its surface and within the ventricles.

A girl, æt. 4 years, having been knocked down by a pocket of hops falling from a height upon her, was taken up quite insensible, and brought to Guy's. She was admitted perfectly unconscious, in a comatose condition, and with stertorous breathing; this continued without any interval until her death, sixty hours after the injury; there were at the same time frequent twitchings of the limbs and rigidity of the muscles; the pupils also were fully dilated. After death the bones were found to be quite sound, and free from fracture. The brain was bruised all over, especially towards the anterior lobes, and upon its upper surface; and at its base the anterior and middle lobes were likewise ecchymosed. Blood also was extravasated at these injured spots. The fluid in the ventricles was of a pinkish colour, and the parts around were ecchymosed.

The case just quoted is a good illustration of concussion of the brain causing ecchymosis of its structure to a great extent, both externally and within the ventricles. It may, however, be found in all degrees, from the mere local bruise to the almost pulpy condition of the cerebral masses, as indicated by the case just given.

I shall now pass on to give an example of extravasation of blood upon the surface of the brain, accompanied with slight laceration of the brain-structure, as a result of concussion.

Case xii.—Concussion; Extravasation of Blood upon the surface of the Brain, and Ecchymosis.

A man, æt. 31, when drunk, wrestled with a companion,

and was thrown violently against a curbstone upon his head. He was removed to a hospital in an insensible condition, where a scalp-wound, which was produced by the fall, was strapped up, and he was then carried home. The following day his consciousness partially returned, and he had a fit (apparently epileptic); and as this recurred upon the third day, his friends brought him to Guy's. He was admitted under the care of Mr. Cock, perfectly insensible, with contracted features, and an anæmic appearance. He had a hot skin and rapid pulse, his pupils were contracted, and there was great restlessness and slight delirium; a lacerated wound also existed over the left occiput. His head was shaved, and cold lotion was applied to it, a mercurial purge being ordered. Upon the next day, or upon the fourth after the accident, a severe epileptic fit took place, and returned every five or six hours till the evening of the fifth, the left side of the body being the most affected. During the intervals a semi-comatose condition existed, and the skin was bathed with perspiration; he could, however, be roused with difficulty, and answered questions quite rationally; the pupils were obedient to light.

Upon the seventh day he was much improved, and appeared more sensible. Upon the eighth day symptoms of delirium tremens showed themselves. Opium was freely given, but failed to produce sleep till the tenth day, after thirteen grains had been taken; he then slept twelve hours, and upon waking was more rational, and was evidently relieved. Opium was continued at intervals, and he appeared to improve gradually until the twentieth day, when he became very drowsy, and this passed on to a semi-comatose condition. He could, however, be roused, and answered questions. He remained in this condition, at times uttering a shrill sudden scream, and then relapsing into quietude. His pupils became contracted, and his fæces and urine passed involuntarily. In this condition he remained for seven days, being more or less restless; he then became quite sensible, and at the expiration of three hours died quietly.

His body was examined forty-six hours after death.

Upon the occiput there was a dry scabby wound, about the size of a crown.

Upon removing the scalp, several ecchymosed spots were

observed over the posterior part of the left parietal bone, but no injury to the bone could be detected. When the calvaria was removed, the dura mater upon the right side was baggy, quite clear and healthy. On dividing it, and exposing the whole surface of the brain, a layer of blood was found to be universally diffused over it, this layer being less upon the left side, and there principally in the meshes of the pia mater, and between the convolutions; but upon the right side there was a clot almost an inch thick, especially over the anterior and lateral lobes, passing downwards towards the base. The clot was shreddy, of a dull reddish black colour, and had evidently been effused for some days. On the posterior part of the left hemisphere a small portion of the convolutions was softened, of a red colour, and with an adherent clot; a similar state was also found upon the anterior lobe of the right side, evidently the result of *contre-coup*.

None of the sinuses or large vessels could be found injured. They all appeared healthy, as also were the minute capillaries.

The brain was firm, but congested, and the other viscera quite healthy.

In this case there was no doubt about the character of the accident, and there also was none as to the cause of death, extravasation of blood upon the brain and laceration of its structure having taken place as a result of pure concussion. The vessels were also found, after a careful examination, to be quite free from disease, forbidding the idea of an apoplexy having taken place.

If this had not been the case, and considerable disease of the cerebral arteries had been detected, such a doubt would naturally have arisen; and it is in such cases of extravasation of blood within or upon the brain, associated with an injury, that much difficulty is often experienced by medical jurists. It is true that where the vessels of the brain are diseased, a rupture of their coats, and, as a consequence, an apoplexy, is more likely to result from a slight injury than where those vessels are sound; and the following case is a good example of such an occurrence.

CASE XIII.—CONCUSSION; DISEASED VESSELS; EXTRAVASATION OF BLOOD INTO BRAIN.

A man, æt. 56, when descending a ladder, fell from a height of thirty feet, striking his head in the descent against a projecting wall. He was taken up quite insensible, and in this condition was admitted one hour after the accident under the care of Mr. Hilton. He was perfectly unconscious, with a slow, labouring pulse, stertorous respiration, and contracted pupils; the eyes rotated constantly in their orbits, and an abrasion existed on the left ear.

The following day, when addressed sharply, he partially opened his eyes. His pulse was rapid, and his urine flowed involuntarily from him. The second day his skin became hot, pulse more rapid, and peculiar spasmodic attacks of difficulty of breathing appeared, accompanied with some movements of his limbs. A few ounces of blood were taken from his left external jugular vein, reducing the pulse; but the patient rapidly sunk.

Forty-five hours after death the cranial bones were seen to be full of blood, but not fractured. The dura mater was found congested, with a thin layer of bloody serum beneath; the arachnoid was thickened and opaque; the pia mater infiltrated with semi-coagulated fibrin, easily separated from the convolutions. At the base of the brain the arteries were in shape, and quite rigid from disease, and in the substance of the hemispheres *were several points of extravasated blood, about the size of peas.*

The heart was hypertrophied, and the left valves thickened. The kidneys were coarse and granular.

There would be no difficulty in quoting other cases where doubts would be experienced in forming an opinion as to the cause of death. In this case, did the man fall as a consequence of an apoplexy? or was the extravasation of blood the result of the fall?

It is difficult to express an opinion upon such a point; but as it is not common for an apoplexy to take place from many vessels at the same time, and as in this instance such was the

condition, and as we fairly expect that a violent shaking of the head, or concussion, in a man the subject of extensive arterial disease, would be likely to produce rupture of the diseased vessels, and as a consequence multiple apoplexies, I am disposed to give my assent to the latter query.

Authors have described the occurrence of extravasation of blood external to the dura mater, between it and the bone, as a result of concussion of the brain. There may be some doubt as to the occurrence of such instances; at any rate, they are very rare. I have no notes of such a case, and will not therefore quote an example. The extravasation is said to be produced by rupture of one of the meningeal arteries, and there are no symptoms by which such an accident can be distinguished, that is to say, there are none which will enable the surgeon to diagnose the exact seat of the extravasation, whether it is within or without the membranes. To make out the fact that extravasation has taken place is not generally a task of difficulty.

As a rule, however, I am disposed to believe that in cases of rupture of a meningeal artery some fissure or fracture of the skull will be detected upon a careful examination—it may be only a fissure at the point of injury, but a fissure will be found. It is difficult to understand how a rupture of a meningeal artery running in a bone could take place without a fracture, but the authorities upon which such instances are given forbid any direct contradiction to the fact.

CHAPTER II.

FRACTURES OF THE CRANIUM.

The fact that fractures of the skull are in themselves of small consequence, as long as the cranial contents are uninjured or uninvolved, is now so well understood, that it needs no comments in these pages.

But it is seldom that such uncomplicated cases are seen in practice; the bones of the skull are of a firm and compact

structure, and any injury to them sufficient to produce fracture will, as a rule, cause what has been described as concussion of the brain. This complication is the simplest that can take place. It is true that that concussion may be associated with other complications, such as have been already described—as hæmorrhage upon the brain, or within its structure; laceration or bruising of the cerebral masses; and, as a secondary complication, arachnitis, or inflammation of the brain itself. But besides these there are other complications which are more frequently associated with or are peculiar to fractures of the skull, such as depression of bone, producing compression of the brain; extravasation of blood external to the dura mater, from rupture of the meningeal artery; injury to the membranes, or injury to the brain.

The subject of fractures of the cranium may consequently be divided into several classes, each of which is worthy of a separate consideration.

A. Fractures of the skull unassociated with any encephalic complication.

B. Fractures complicated with simple concussion.

C. Fractures associated with extravasation of blood external to the dura mater.

D. Fractures complicated with extravasation of blood upon the surface of the brain.

E. Fractures associated with extravasation of blood within the cerebral structure.

F. Fractures complicated with depression of bone.

G. Fractures complicated with direct injury to the brain-structure.

H. Fractures of the base of the skull.

A. *Fractures of the skull unassociated with encephalic complications* are no doubt of great rarity, for it is difficult to understand how a force can be applied sufficient to produce a fracture of the cranium without at the same time causing some concussion of the brain; this concussion may be very slight, and may be known

perhaps by only a slight confusion, thus escaping the observation of the surgeon, who sees the case generally after the lapse of some short period of time. Cases are not unfrequent where a fracture of the skull has been overlooked, the local contusion and the severe symptoms of concussion for a time masking the injury, the fracture being subsequently discovered when the swelling has subsided. Practically, however, this is not of very great importance, as it is not the mere fracture of the skull which causes danger, but the injury to the cranial contents.

An interesting case of incised wound of the skull may here be quoted, unassociated with any cerebral disturbance. It is as follows.

Case xiv.—Incised Wound of Skull, involving only the External Table.

A labouring man, æt. 27, received a blow over the vertex from a broken sword; an extensive scalp-wound was the result, and a very evident incised wound in the upper portion of the frontal bone apparently involving only the external table, and uncomplicated with the slightest cerebral disturbance. The edges of the scalp-wound were brought together, and a steady convalescence ensued, without a bad symptom.

Fracture of the skull may take place over the frontal region; and involving the frontal sinuses, the primary effects of the injury may be chiefly manifested there, although the fissures may radiate more extensively; in these cases the brain itself may be uninjured and no cerebral disturbance take place. The following case is a good example of such an injury.

Case xv.—Fracture of the Skull, involving the Frontal Sinuses; no Cerebral Symptoms.

A boy, æt. 6, having been knocked down by a horse and trampled upon, was admitted into Guy's Hospital, under the care of Mr. Birkett, with severe ecchymosis and swelling of the whole forehead, and an extensive scalp-wound and compound fractured

skull over the frontal region. The finger could be freely introduced into the wound and depressed bone felt; there were, however, no brain-symptoms, and the child was not even stunned by the injury.

Water-dressing was alone applied to the wound, and the child kept in bed. As the swelling subsided a fracture was clearly detected, radiating upwards from the primary seat of injury to the right parietal region. Convalescence steadily followed, and the boy left with the wound nearly healed six weeks after the injury.

B. The next class of cases which require illustration are much more frequent than the last; it includes all those examples of fractured skull *associated with simple concussion of the brain*; that is to say, where, after the receipt of the injury, the functions of the brain are for a time more or less interfered with or suspended, but which have a tendency gradually to return to their normal conditions.

Case xvi.—Fracture of the Skull; Concussion; Secondary Inflammation, and Recovery.

A child, æt. 4, twelve hours prior to her admission, fell out of a window upon her head; she was taken up quite insensible, bleeding from the right ear; vomiting speedily came on, and continued at intervals for some hours; about ten hours after the injury she became sensible, and spoke, asking questions, but as she relapsed into insensibility she was brought to Guy's. Admitted very drowsy, but could be easily roused; pupils natural and acting, skin moist and warm, pulse quick and of moderate power. A cold lotion was applied to the head, and two grains of gray powder ordered to be given every three hours.

For several days she was very restless and feverish, and upon the fifth day appeared to be quite blind; the pupils were dilated and refused to act. The mercurial was continued, and in another five days the child much improved, and the sight began to return. The child groaned a good deal during the night, but had perfect use of her limbs. After the lapse of another week the sight appeared to be perfect, all fever had left, and the child's natural manner returned; a fracture was then discovered, passing over the frontal bone towards the squamous portion of the temporal, and the child left the hospital after a month's residence, convalescent.

This case is a good illustration of fracture of the skull complicated with concussion; this was followed by some inflammatory symptoms, apparently involving the optic nerves, causing temporary blindness. The treatment adopted was most successful; as the secondary inflammatory symptoms were subdued, sight returned, and a good recovery ensued.

The fact that a fracture of the skull was subsequently discovered is a point of interest, the severity of the cerebral complications demanding the chief attention, and the effusion which must have taken place in the line of fracture having for a time concealed the injury.

Case xvii.—Fractured Mastoid Process; Local Emphysema; Secondary Facial Paralysis, and Recovery.

A man, æt. 45, when at work received a blow behind the left ear from the handle of a crane; the accident was followed by insensibility for fifteen minutes, and when admitted, about half an hour after the injury, he was quite sensible. There was a scalp-wound over the seat of injury, and some local emphysema, passing upwards upon the side of the head, evidently indicating that the mastoid cells were opened; there was no discharge from the ear, or facial paralysis. Simple water-dressing was applied, and after three days the emphysema had disappeared. No bad symptom or anything abnormal showed itself till the ninth day, when he first complained of a noise in the left ear, followed upon the next day by deafness and facial paralysis. A blister was applied to the neck, and a mercurial, in the shape of Hydrarg. c. creta, gr. iv, twice a day. After a week these symptoms began to subside, and in a fortnight the facial paralysis had disappeared, and although he stayed in the hospital another month, he left well in every respect, excepting slight deafness upon the injured side.

In this case of compound fracture of the mastoid process slight concussion was produced by the injury; those symptoms rapidly subsided, together with the emphysema, which was an interesting complication. Upon the ninth day the deafness and facial paralysis must have been produced by some inflammatory action within the petrous bone, and although the treatment adopted proved of sufficient value to restore the facial nerve to its normal condition, the more delicate structure of the auditory failed to receive equal benefit, and some slight deafness was the result.

C. *Fracture of the skull, associated with extravasation of blood external to the dura mater.*

This form of injury will be best illustrated by the following case.

Case xviii.—Fractured Skull; Concussion; Ruptured Meningeal Artery and Hæmorrhage external to the Dura Mater; Coma, and Death.

A man, æt. 49, when riding in a gig, was thrown out upon his head; the accident produced a scalp-wound over the left side of the vertex, and some insensibility; this speedily passed away, and he got up and walked for about half an hour. He then became confused and staggered; he went into a shop, and was supposed by the shopkeeper to be intoxicated, but as he gradually became quite insensible he was brought to Guy's. He was admitted under the care of Mr. Cock, perfectly unconscious and comatose, with dilated pupils, labouring pulse, and slow respiration; he very soon became convulsed, the right arm being the most so; this, however, in a few hours became paralysed. He remained in this condition for two days, and died comatose.

After death, upon removing the calvaria, a large clot of blood was seen lying upon the dura mater, proceeding from the middle meningeal artery; it was about two and a half inches in diameter, and more than one inch in thickness; it formed a globular tumour, and caused an extensive depression upon the left hemisphere beneath the parietal bone. The surface of the brain was healthy, but the pressure of the clot

had altered its whole shape, the longitudinal fissure being pressed to the right, and presenting a concavity to the injured side.

The skull was fractured in a vertical direction, the fissure passing from the middle of the left parietal bone to the jugular foramen. The bone was thick and spongy, whilst the bone at the base was in spots as thin as a wafer. This was the only injury.

This case scarcely requires any comment; it tells its own tale. A man is thrown out of his gig, and receives a scalp-wound and some concussion of the brain; in a few minutes these symptoms pass away, and he walks about; when reaction has become established the middle meningeal artery, which was torn through by the fall, pours out its blood; the man becomes confused and giddy, as if intoxicated; the effusion continues, pressing gradually upon the brain; at first it acts somewhat as an irritant, causing twitchings and convulsions of the limbs, but soon, however, by its pressure, it paralyses the brain, causing coma and death.

In any case presenting symptoms like the preceding, the diagnosis of extravasation of blood becomes tolerably certain; its exact seat, however, is another point. The fact that the man took two days to die would perhaps indicate pressure from above, as pressure upon the base causes more immediate paralysis of the respiratory nerves, and death therefore becomes more rapid.

If the extravasation had taken place within the arachnoid, the blood would have gravitated downwards to the base, and, as a consequence, would have destroyed more quickly; but, although it is not difficult to form an opinion as to the fact of hæmorrhage taking place, it is almost impossible to diagnose its exact seat, except in quite exceptional cases.

One of those is well represented by the following example.

Case xix.—Fractured Skull over the course of the middle Meningeal Artery; Extravasation of Blood external to the Dura Mater; Operation and Recovery.

An engineer, æt. 16, when at work, received a severe blow

from a piece of wood, projected from a steam lathe, over his left temple. The accident produced total insensibility and an extensive scalp-wound. Admitted six hours after the injury, perfectly unconscious and comatose; the limbs seemed quite useless, and pupils dilated. There was much hæmorrhage also from the wound. Mr. Hilton, under whose care he was admitted, enlarged the wound, and found much blood effused beneath the pericranium, and beneath this were radiating fissures, through which blood oozed; there was also some slight depression. By the elevator three pieces of bone were removed, exposing a clot of blood external to the dura mater; this was taken away, and healthy membrane became visible. After this operation the patient became more sensible, pulse more rapid, and breathing less stertorous. For three days he remained in a very restless condition, taking no nourishment; but after that he gradually recovered, leaving the hospital cured.

In this case the character and position of the injury fairly led the surgeon to suspect a fracture, and with it a laceration of a meningeal artery. The blow was a sharp and sudden one, causing a local injury. The position of the wound was exactly the one where the middle meningeal artery was situated, and thus a fracture on such a site was likely to be associated with its rupture.

The correctness of the opinion was verified by the success of the operation, and the subsequent termination of the case justified both.

CASE XX. — COMPOUND COMMINUTED FRACTURED SKULL; HÆMORRHAGE, AND ABSENCE OF HEAD-SYMPTOMS TILL THE EIGHTH DAY; REMOVAL OF LOOSE BONE AND CLOT, WITH RELIEF TO SYMPTOMS; EXPOSURE OF DURA MATER; SUBSEQUENT EXFOLIATION OF BONE; GRADUAL RECOVERY.

Jessie N—, æt. 46, was admitted July 25th, 1858, under the care of Mr. Birkett, having a short time previously, when asleep with her head resting upon a pillow, been struck by her husband upon her head with the butt end of a large hatchet.

When admitted, there were three scalp-wounds on the left side of the head, from which it was said much hæmorrhage had taken place—the anterior one situated a little above the left eyebrow, a middle one over the temporal fossa; and a third over the left parietal tuberosity. With the finger the surface of the skull could be touched, and a fracture was discovered. She was in an almost unconscious state, but replied to questions, although in a low tone. The pulse was very feeble, but there were no indications of severe cerebral injury. Perfect rest was enjoined, and the wounds were covered with wet lint. She went on well, and upon the fourth day there were still no indications of cerebral injury, and the only complaint she made was of severe pain in the head. She replied to questions sensibly; the wounds had, however, assumed a sloughing aspect, and were dressed with the addition of a little nitric acid in the water.

Upon the eighth day the first cerebral symptoms made their appearance, the muscles of the upper extremities became convulsed, and the hands clenched, the *left* pupil was also more *dilated* than the right; she seemed light-headed, and did not reply to questions so sensibly as before; the pulse was slow and weak, and her expression was anxious. As these symptoms indicated local pressure of the brain at the seat of injury, Mr. Birkett, at 1 p.m., laid the two wounds into one, exposing the bone, which was seen to be extensively fractured in a radiating manner, and in parts depressed. By gentle manipulation two large pieces of bone were removed; one, the anterior piece, showed a larger surface of the external table and a small portion of the internal, whilst the posterior fragment showed a small portion of the external table, and a large surface of the internal; the internal table of this fragment contained the groove for a branch of the middle meningeal artery, and in one of the grooves the fracture extended.

When the two pieces of bone were removed, a large coagulum of blood was seen, which entirely obscured the dura mater, and when a thin plate of the inner table was gently elevated active arterial hæmorrhage took place, which immediately ceased when it was left alone. Mr. Birkett left this small loose portion of bone *in situ*, to be detached by natural processes. Upon the ninth and tenth days some hæmorrhage

took place, which was arrested by cold, and the removal of the coagulum. She gradually improved, having lost all head-symptoms after the operation; pulse and pupils became natural, and the wound healthy; and upon the eighteenth day the small piece of bone above mentioned was removed, as it was quite loose. Along its posterior border was half the groove for a branch of the middle meningeal artery, and towards its anterior border the whole groove for another arterial branch.

From this time all things went on well. Upon the seventy-fourth day she began to complain of a peculiar hissing sound or noise in the head, which distressed her much; she was still feeble, but gaining power. Subsequently to this several large pieces of bone were removed, and many small pieces, and the wound healed slowly by granulations from the surrounding integuments dipping into the hole in the cranium, and uniting with the surface of the dura mater.

Her general health gradually improved, and the wound healed; and, after eight months' residence in the hospital, she left cured, having lost seven square inches of the lateral cranial walls, or bone extending three and a half inches from before backwards, and two inches from above downwards.

Remarks.—This case is an admirable illustration of a severe local injury to the skull, uncomplicated with any general cerebral disturbance. Although the bone was most extensively fractured, and the middle meningeal artery torn through, there was but little injury to the brain itself, as manifested by the absence of all cerebral symptoms. The extensive fracture of the skull allowed the blood from the ruptured vessels to escape externally, and, consequently, early compression of the brain was prevented. Upon the eighth day such symptoms first appeared, the external escape of blood having been probably retarded by the formation of the clot, and the compression of the brain was thus caused. The relief afforded to such symptoms by the removal of the bone was very marked, all such disappearing after the operation.

The wisdom of leaving the small piece of bone involving the artery was well shown, and is an interesting point.

The absence of any subsequent meningeal inflammation was very fortunate, and probably the perfect rest and absence of all cause of excitement tended to prevent it; but more probably it revealed the fact that the brain itself was uninjured, the force of the blows having been expended upon the seat of injury.

The case is a most valuable one, as demonstrating to what an extent a local injury to the skull may take place, and a good recovery result.

D. *Fractures of the skull complicated with extravasation of blood upon the surface of the brain.*

This division of the fractures of the cranium, complicated with extravasation of blood upon the surface of the brain, is the most important and the most serious.

In the last cases, given to illustrate hæmorrhage external to the dura mater, the injury is generally a local one, produced by a sharp blow, causing fracture and laceration of a meningeal artery, and the brain, as a whole, is uninjured; but in these which we are now about to consider the extravasation of blood is generally only a symptom of a more serious injury, namely, a laceration of the cerebral structure.

The complication is generally found in patients who have fallen from a height, or have received a very powerful blow from a blunt instrument; as a result, the whole brain is powerfully shaken or concussed, and its delicate structure, being forced against some of the many projecting points of bone within the base of the skull, becomes bruised and lacerated, and, as a result, hæmorrhage takes place. This hæmorrhage may be associated with rupture of the meningeal artery and extravasation of blood external to the dura mater, as it may be with laceration and ecchymosis of the interior of the brain; the injury to the brain and seat of the hæmorrhage is generally at the base, and is produced by what is called *contre-coup*.

Case xxi.—Fracture of Skull; Extravasation of Blood and Contused Brain from Contre-coup.

A man, æt. 46, having been thrown off his horse, was taken

up insensible and with a severe scalp-wound over the left temple. In this condition he was admitted into Guy's Hospital, under the care of Mr. Birkett. No fracture could be detected. He was perfectly unconscious and unable to move, the left pupil was dilated and fixed, respiration labouring, pulse slow, and in this condition he remained till he died, sixty hours after the accident.

Necropsy.—After death, when the calvaria was removed, a fissure through the bone was detected at the seat of injury, passing upwards; and, upon removing the brain, it was seen to descend along the middle fossa, through the sphenoid bone, to the carotid canal. Upon removing the dura mater a layer of blood was seen covering the brain, but more upon the right side than the left, and the base was covered. This proceeded evidently from a severe contusion upon the middle lobe of the right side; the brain at this part was pulpy, but at the seat of injury (left side) it was quite uninjured; all other parts of the brain were sound, and the other viscera were healthy.

This case is a good example of injury to the skull, and extravasation of blood as a result of injury to the brain by *contre-coup*. It is this injury to the cerebral structure which is always to be feared in severe falls or blows; and if the part itself, corresponding to the force, is wounded, the opposite or base of the brain is, as a rule, likewise involved. This fact always makes the diagnosis of injuries to the skull a task of difficulty, and the prognosis always unfavorable.

In any injury, however, to the head, which may produce a violent shaking of its contents, extravasation of blood rarely takes place in any part; and where it is associated with fracture, hæmorrhage external to the dura mater is frequently found. Whenever fracture of the skull takes place, some hæmorrhage in the line of injury is generally seen; but it may be to only a very limited extent, and it is only when a trunk of a large vessel has been injured that the brain becomes compressed, and a fatal termination is to be expected from that cause.

CASE XXII. — FRACTURED SKULL; CONCUSSION OF THE BRAIN; ECCHYMOSIS BY CONTRE-COUP; EXTRAVASATION OF BLOOD AT BASE, AND EXTERNAL TO THE DURA MATER.

A woman, æt. 25, when cleaning windows, fell backwards, from a height of twelve feet, upon her head. She was taken up quite unconscious, bleeding from both nostrils, and immediately admitted into Guy's, under the care of Mr. Hilton. She was insensible, but moaning and restless; pupils were dilated and insensible, and there was some subconjunctival ecchymosis. The pulse was small and irregular, 130; skin cold, but no paralysis; upon examining the right temple, upon firm pressure, there was evidence of fracture. She remained in a very restless condition for twelve hours, refusing to answer questions, but the next day she became more sensible; she complained of pain in her head, and was very restless, and moaned frequently; her breathing was quick, and pulse rapid.

The next day she was so violent that a jacket had to be put on to prevent injury; she passed her urine involuntarily, and became comatose, dying in that condition fifty-nine hours after the accident.

Upon examining the body the skull was found extensively fractured, fissures radiating from the seat of injury downwards towards the base of the skull. Blood was effused external to the dura mater in the middle fossa, particularly towards the base; the middle lobes of the brain were much bruised, and covered with extravasated blood.

In this case we have well illustrated the results which very frequently follow a fall upon the head from some height. The skull is fractured, and the fissures pass downwards to the base, as indicated by the subconjunctival ecchymosis. The accident is followed by a suspension of the functions of the brain; but consciousness returns, and with it reaction, attended with intracranial hæmorrhage; this hæmorrhage causes pressure, and consequently, insensibility, and, after a few hours, coma and death.

The brain, however, does not escape uninjured. The severe jar produced by the fall causes ecchymosis of its structure at the base by *contre-coup*, and with it extravasation of blood, the two sources of hæmorrhage combined proving sufficient to cause a fatal termination.

The following case is also one of secondary hæmorrhage upon the brain. No post-mortem examination was allowed, consequently there may be some doubts upon the case.

Case xxiii.—Fractured Skull; Secondary Hæmorrhage; Death.

A man, having fallen from a height upon his head, was taken up partially insensible, and admitted under the care of Mr. Cock. He was to a certain extent conscious, with a slow respiration, and endeavoured to answer questions. There was no paralysis, but there was some bleeding from both his ears. There was an extensive wound over his right parietal bone, and evident fracture, but no depressed bone; he gradually became quite sensible and spoke freely. He was left at night quite comfortable, but in the morning was found with paralysis of the *left* side, and also of the *right* facial nerve; he was heavy, and roused with difficulty, opening his eyes when spoken to with a loud voice, but he did not speak.

He gradually became more unconscious, and at last comatose, dying sixty-two hours after the injury.

Although the exact condition of parts could not subsequently be demonstrated, the history of the case is one which tolerably clearly tells its own tale.

The man from the fall received a compound fractured skull, and concussion of the brain primarily took place; from this the man partially recovered, and when reaction had fairly set in, and the circulation was freely established, a meningeal artery, which had no doubt been lacerated at the time of injury, poured out its contents, and compression of the brain, coma, and death, followed.

The paralysis of the *left* side and of the *right* facial nerve indicated an extravasation upon the right side (the seat of injury), and also that the extravasation was situated in the

middle fossa, involving the portio dura or seventh nerve; and, indeed, in such cases, the extravasation is almost always towards the lower part of the skull, although there may be some upon the upper surface of the hemisphere; and it is this fact which tells so much against the operation of trephining, the surgeon being unable to reach the most important clot, viz., that at the side and base of the skull, although by the operation he may relieve the pressure upon the upper surface.

E. *Fractures associated with extravasation of blood within the brain-structure.*

When a patient receives any severe injury to the head, sufficient to cause fracture, there can be no difficulty in understanding, from the cases already quoted, that at times blood should be extravasated into the substance of the brain, and the interior of the brain lacerated from the severity of the concussion.

In the following pages cases will be quoted to exemplify such injuries, and they form some of the most serious which come before our notice.

In instances already quoted ecchymosis of the walls of the ventricles has been clearly indicated, and in the following case a more exaggerated example of intracerebral injury will be made known.

Case xxiv.—Fractured Skull; Extravasation of Blood external to Brain and within Ventricles, with Laceration of Cerebral Structure.

A man, æt. 52, was found by the side of the Surrey Canal by the police, and believed to be very drunk: he was taken to the station-house, and kept there for two hours; but as his insensibility became gradually worse, and at last perfect, he was brought to Guy's. He was, when admitted, quite unconscious and paralysed; his respiration was stertorous, pulse slow and labouring, and pupils dilated. Upon examining the head, a ridge of fractured and depressed bone was felt over the occiput, beneath an extensive bruise. In one hour he died.

After death, upon examining the body, severe contusions

were seen upon his loins, sacrum, scapula, arm, dorsal aspect of his hand, and also over the occiput, where blood was freely effused.

The skull was found to be extensively fractured in the occipital region; the occipital bone was loosened, and the suture separated; some of the serrated edges were broken off, and the bone could easily be moved upon the parietal. The interstices of the fracture were filled with blood.

Upon removing the calvaria the dura mater was found to be entire, but some blood was extravasated beneaththe fracture. The left hemisphere of the brain was covered with blood, and this passed downwards to the base.

The middle lobes of the brain were extensively lacerated and pulped, being covered with extravasated blood. This blood extended inwards into the ventricles, which it filled.

The blood-vessels were healthy; kidneys slightly granular.

The above case is one of great interest, the absence of any history as to the cause of the accident and the extensive amount of injury, alone marking it out for observation.

There was no doubt that the man had received a severe blow upon the occiput, whether by an instrument or simply from a fall may be a question; the numerous ecchymoses upon other parts of the body probably indicated that the former was the cause, and that upon the dorsum of the hand pointed to a scuffle, and a blow to make the sufferer leave go his grasp. The police, of course, were quite innocent in the matter, however much these points were against them.

The early symptoms which led the police to regard the man as intoxicated is of importance, as it appears that the symptoms of commencing and early extravasation often give rise to such an error; and when the surgeon hears such a history, and the patient soon becomes insensible and comatose, internal extravasation, with injury to the surface of the brain, may fairly be suspected.

The diagnosis is of scientific interest, although, practically, little can be done. The surgeon must, in these cases, really fold his hands and watch the succession of symptoms, and with them the too certain death of the victim.

CASE XXV.—FRACTURE OF THE BASE OF THE SKULL; CONCUSSION, AND LACERATION OF THE SEPTUM LUCIDUM, WITH ECCHYMOSIS OF THE VENTRICLES; EXTREME EMACIATION, ARACHNITIS, AND DEATH.

A man, æt. 37, when working upon the railway, received a severe blow upon the *right* temporal region from the buffer of an engine. He was taken up quite insensible, and admitted into the hospital with a cold skin, slow pulse, labouring respiration, and contracted pupils; no fracture was detected, but *right* subconjunctival hæmorrhage indicated a fracture at the base; after a few hours reaction set in, with slight delirium. The following day he was quite quiet, and breathed calmly; skin was warm; pulse 85, and full. The second day he became more sensible, answering questions, and paralysis of the *left* facial nerve was observed. Hyd. c. Cret. gr. ij, c. P. Dov. gr. v, were ordered three times a day. He went on without any change till the thirteenth day, being sensible, and asking for what he wanted; no paralysis existed, except in the left face; pupils were natural; skin moist, and pulse regular; but upon the thirteenth day he complained of feeling sick, but not vomiting. His secretions were good, and he took food in moderate quantities, but had emaciated most rapidly. On the fifteenth day, he became slightly delirious at night; on the sixteenth, his urine passed away involuntarily; seventeenth, very restless, and complained of headache; eighteenth, subsultus tendinum, quick respiration; and on the twentieth he gradually sank, quite sensible, and paralysed only in the face.

After death, upon removing the scalp, no fracture was visible. On taking the calvaria off, the dura mater appeared quite healthy, the two layers of the arachnoid were adherent in five places, and the visceral layer was somewhat opaque; the pia mater was congested, and the convolutions of the brain wasted.

The ventricles of the brain contained double the normal amount of fluid, and the floor of the right presented a patch of ecchymosis; the septum lucidum was ecchymosed and lacerated for one inch, laying the two ventricles into one.

The posterior extremity of the cerebral hemisphere was

ecchymosed, particularly at the left side, and the anterior extremity of the right was slightly so, and beneath it the skull was fractured. The base of the skull was extensively fractured; the line extended from the right anterior inferior angle of the parietal downwards towards the frontal, across the orbital plate and posterior portion of the crista galli, through the left orbital plate and interior table of the frontal bone forming the posterior wall of the left frontal sinus. The frontal sinus contained blood, as also did the right orbit.

There was no injury seen to the left ear.

The lungs were partially hepatized, with small pyæmic abscesses. Bronchi filled with tenacious mucus. The other viscera were healthy.

The chief interest of this case is in the form of injury to the brain, the severe concussion produced by the blow upon the side of the head causing laceration of the septum lucidum; the extreme emaciation of the patient is also a point worthy of notice.

The character of the injury, associated with subconjunctival extravasation of blood, most positively indicated fracture of the base in the anterior fossa; and the laceration of the surface of the brain at the point opposite to the injury by *contre-coup* was clearly illustrated.

The diagnosis of the form of injury to the brain was of course obscure, as it too generally is; but pathologically the case is one of some interest, and well illustrates a laceration of the interior of the brain from severe concussion.

F. *Fractures of the skull associated with depression of bone.*

We now approach the consideration of a class of cases which are very marked in their character, and much more satisfactory to the surgeon, as in many cases, by the application of his art, he is enabled to confer considerable advantage upon the victim of the accident.

It includes all those cases of fracture of the skull associated with depression of bone, but uncomplicated with any injury to the dura mater or brain beneath. The accident is generally produced by a *sharp* blow, or fall upon some *projecting object*.

It may be followed by symptoms of concussion, which are of a slight character, or with others of compression of the brain; but neither the blow nor fall has been sufficient to cause more than a local injury, the brain itself not having been sufficiently shaken to lacerate or bruise its structure, and, as a consequence, extravasation of blood has not taken place. In some rare examples of compression of the brain from depressed bone no cerebral symptoms are produced; in these instances it is needless to add that the surgeon's art is not required, as by interference he may produce the very complication he seeks to avoid, viz., encephalic injury.

The following cases will illustrate the subject.

Case xxvi.—Fracture of the Skull; Concussion, and Depressed Bone; no signs of Compression; Recovery.

A boy, æt. 14, having fallen out of a cart upon his occiput, was at once admitted into the hospital, partially unconscious, with cold skin and other symptoms of slight concussion, and also a distinct fracture of the occipital bone and marked depression of bone about the size of a florin.

In a few minutes he completely recovered his consciousness, and appeared quite natural. No one symptom of compression followed, and he left the hospital, after a short residence, apparently none the worse for the accident.

Case xxvii.—Compound Fractured Skull and Depression; only symptom a feeling of weight upon Head, relieved by Removal of Bone; Recovery.

A boy, æt. 16, having received a sharp blow upon the head with a piece of iron, was admitted into Guy's, under the care of Mr. Birkett, with a compound fracture of the skull over the anterior superior angle of the left parietal bone, and depression, the bone being somewhat comminuted. There were no symptoms of concussion or compression, and all the boy complained of was the feeling of a great weight upon the head; this symptom disappeared at once upon the removal of the pieces of bone by forceps, and a steady convalescence followed.

The two cases just quoted are admirable illustrations of

simple and compound fracture of the skull, attended with depression, but not sufficient to cause any suspension of the cerebral functions, and also point out the practice which is suitable to each. In the former case no other means than rest and preventive measures were called for; in the latter the careful removal of the loose bone by means of forceps was all that was required.

In the case which I am about to quote the comminuted bone produced some symptoms which were immediately relieved by its removal, and a good recovery took place.

Case xxviii.—Compound Fractured Skull; Concussion, followed by Constant Vomiting and Pain in Head, relieved at once by Removal of Bone upon the fourth Day; Recovery.

A boy, æt. 9, having fallen off a ladder the distance of four feet upon his head, was rendered partially unconscious; after two hours this state of concussion passed away, and he walked home unattended. His parents examined his head, and found a severe scalp-wound over the left parietal bone. In a few hours he became sick, and vomited his meals; his head also began to ache; these symptoms continuing for *four* days, he came to Guy's.

When admitted, he complained of great pain in the head, more particularly at the seat of injury. There were no other cerebral symptoms; his pupils, pulse, skin, &c., being quite natural. He felt, however, sick, and vomited everything he took.

Upon examining his head there was a scalp-wound over the left parietal bone, and some comminuted depressed bone; this bone was immediately removed by means of forceps, and the headache at once disappeared, vomiting ceased, and he recovered without one bad symptom.

The cases of fractured skull already given associated with depressed bone were unmarked by any symptoms which are generally regarded as indicating pressure upon the cranial contents. The following examples are of another description, and were all complicated with evident symptoms of compressed brain.

Case xxix.—Compound Fractured Skull; Depressed Bone; Trephining and Elevation; Rapid Recovery.

A man, æt. 20, received a blow upon the head from a falling crane; he was rendered completely unconscious, and brought to Guy's. When admitted he was partially insensible, but could answer when spoken to. There was no evident paralysis, but his pupils were dilated and fixed, and his respiration laboured; pulse also slow. Upon the head was a large scalp-wound, over the right parietal bone, and with evident, depression of bone. As the symptoms did not leave him, Mr. Poland trephined the bone about one hour after the accident and raised the depressed portion. A rapid recovery took place, the symptoms present were immediately relieved by the operation, and fifteen hours after he was perfectly natural; he recovered without one untoward symptom, not even a headache, leaving the hospital six weeks after the injury, quite well.

Case xxx.—Compound Fractured Skull and Depression; Trephining, and a rapid Recovery.

A man, æt. 39, when at work received an injury to his head from a brick falling from a height. He was rendered completely unconscious, and brought to Guy's.

When admitted he was very drowsy, although partially conscious; his respiration was slow and labouring; pulse full, but slow; no distinct paralysis was present, and his pupils were dilated.

There was a scalp-wound over the posterior and superior angle of the left parietal bone, and a wedge of bone driven in; it was quite fixed, and could not be removed without the application of the trephine. This was done by Mr. Birkett, and many pieces of broken bone were removed. It was found that the inner table of the skull was extensively fractured, much more so than the outer; the dura mater, however, was uninjured. All bad symptoms rapidly disappeared; upon the eighteenth day erysipelas attacked his head, without, however, causing any ill effects, and in nine weeks after the accident he left convalescent.

CASE XXXI.—FRACTURED SKULL AND DEPRESSION; COMPRESSION OF THE BRAIN; ELEVATION OF BONE BY MEANS OF THE TREPHINE; RAPID RECOVERY.

A boy, æt. 12, having fallen from a tree upon the edge of a brick, fractured his skull at the junction of the posterior superior angle of the parietal bone with the occipital. He was taken up insensible, and admitted into Guy's under Mr. Cock. He was quite unconscious, and incapable of moving; pupils were dilated and fixed; pulse and respiration slow and labouring. There was a scalp-wound, and very evident local symptoms of depressed bone, with compression of the brain. Mr. Cock at once applied the trephine, and elevated the depressed bone. The boy soon became conscious, and without any interruption by a bad symptom rapidly convalesced.

From the consideration of the previous cases some valuable conclusions may fairly be drawn.

First. That fractures of the skull, although attended with depressed bone, if uncomplicated with any severe concussion of the brain, and therefore with any cerebral injury, and if the dura mater remains uninjured, as a rule, terminate successfully.

Secondly. That simple fractures of the skull, associated with depression, if unattended with marked symptoms of compression, are to be left alone.

Thirdly. That compound fractures of the skull, attended with depression and comminution of the bones, are to be treated by the removal of the loose portions; and if symptoms of compression exist, and the bones cannot be removed without the use of the trephine, that instrument is to be employed, although with great care, as it would appear that severe injuries to the cranium may recover, as long as the membranes are entire and the cerebral hemispheres are uninjured; but a totally different conclusion will be manifested when we come to consider the next class of cases, where the brain itself has not escaped the injury.

In all the cases of depression of bone the injury has been produced by a sharp blow, the instrument acting locally only upon the injured cranium; and it is remarkable to what an extent the skull may be fractured, and a recovery take place, if the membranes and brain are not primarily injured, and no subsequent inflammatory mischief supervene. A simple local injury, with severe general concussion, is much more serious than an extensive local one, uncomplicated with concussion or injury to the brain. The dangers of all injuries to the skull depend entirely upon the mischief to the cranial contents, and severe concussion is likely to produce some laceration of the cortical structure of the brain by the *contre-coup*, or some laceration of the more delicate central portions, and, as a result, extravasation of blood is sure to follow, or inflammation of the brain-substance and its membranes. These complications are produced by severe shocks of the brain, from whatever cause: falls from a height, blows from blunt instruments, or any similar injury; and it is from these causes that cerebral injuries are so fatal.

The mere local injury is of comparatively slight consequence, if it is confined to the spot, and the last few cases quoted illustrate the truth of the remark, and in all the injury was caused by a fall upon, or blow with, some sharp instrument.

G. *Fractures complicated with direct injury to the cranial contents.*

In the remarks with which I have concluded the last section of this subject, I asserted that the dangers of all injuries to the skull depend entirely upon the mischief caused to the cranial contents; that extensive intracephalic complications may be produced by slight external injuries; and also that severe external injuries, unassociated with intracephalic mischief, may generally terminate favorably.

In the present section I proceed to show how powerfully nature resents any scratch or injury to the dura mater, and how even any bruise of the brain-structure, and much more how any severe injury to it, is followed by an almost certain death. Any mischief to the cranium itself, uncomplicated with these injuries, may be recovered from; but with them they are most dangerous, and the prognosis is always unfavorable.

CASE XXXII.—COMPOUND FRACTURED SKULL, WITH DEPRESSED BONE; ELEVATION; DURA MATER FOUND INJURED; ENCYSTED ABSCESS IN THE BRAIN; DEATH.

A boy, æt. 14, having received a severe blow upon the head from a hammer which a fellow workman was swinging previous to dealing a heavy blow upon a rivet, was admitted half an hour after the accident into Guy's, under the care of Mr. Birkett. He was collapsed and retching violently, but not vomiting. Insensible, with contracted pupils, and a pulse scarcely to be felt. There was some bleeding also from the left ear.

Above the *left* ear there was a wound, and a depressed circle of bone. This was at once raised by an elevator, and the dura mater was seen to have been scratched. After the operation the boy became more sensible; he passed, however, a very restless night, at times uttering a loud scream, and constantly raising his hand to the seat of injury. These symptoms of arachnitis increased, and upon the fifth day there were spasmodic twitchings of the *right* face and paralysis of the *right* arm; skin very hot, and pulse rapid and very hard. He was bled to six ounces with decided benefit. The acute inflammatory symptoms partially subsided, and upon the seventh day the skin was cool, and the spasm of the facial muscles was less, and there was some power in the right arm. From this time he steadily improved, all paralysis leaving him, and the wound gradually healing; he took his food well, and although not disposed to talk, was quite sensible.

Upon the thirtieth day he was seized with pain in the head and vomiting, but after a few days this passed away; upon the fortieth the pain again returned, and gradually became worse till the forty-fifth; he then became very drowsy, although he took his food well. He seldom moved, although there was no paralysis; pupils were quite natural. He again began to improve, and his manner became more natural; he apparently was daily improving, when upon the seventieth day he became very drowsy and refused food; skin moist, and pulse quick and feeble; pupils normal. There was no paralysis. In this condition he remained, apparently merely sinking, and died upon the seventy-fifth day.

Autopsy.—On the left side of the head, at the seat of injury, was a recently healed wound, two inches in length, with only a slight exudation from the cicatrix; around the cicatrix the tissues were soft, and somewhat bulged outwards. Upon removing the scalp, this bulging was found to be due to a projection of the brain, or to a hernia cerebri, and therefore, upon cutting it through on a level with the surface of the skull, a considerable portion of brain-structure was removed, contained in its covering of dura mater. These parts were firmly united to the scalp and cicatrix, and were cut out together. They were discoloured, and contained inflammatory products, but were not soft, and nothing like pus was discoverable. It was impossible to say whether the dura mater had been torn or not at this spot, as it was so intimately adherent to the cicatrix that the fact was not ascertainable.

The focus of the injury upon the skull was the middle of the lower part of the left parietal bone; at this spot the bone was comminuted; some pieces were loose and others gone. The opening through which the brain protruded measured two inches and a half in diameter, and reached to the eminence in the centre of the bone; the lower border was formed by loose pieces of the parietal bone, united and firmly bound together by fibrous tissue; the meningeal artery had just escaped laceration. At the anterior part of the wound was a small piece of bone half an inch square, which was firmly fixed upon the anterior inferior angle of the parietal bone; the periosteum had disappeared, an ossifying fibrous tissue was formed between them, and the two pieces were fast growing together. A fissure passed forwards from the opening round to the other side of the head. The middle fossa of the base was broken into several pieces, and the roof of the orbit fissured.

These parts were firmly fixed and were rapidly uniting. The connecting substance between the fractures was of a hard bony tissue, and for an inch or more on either side of the fractures the inner surface of the skull was covered with minute bony granulations, producing an uneven rough surface; the bone too was highly vascular. The dura mater was firmly adherent to the bone near the hernia cerebri at its lower portion; internally it was firmly united to the brain for a considerable distance all around. Upon stripping off the membranes, the

arachnoid being greasy from an inflammatory exudation, the surface of the brain appeared quite perfect, except where the hernia had been cut off; it was flattened, so that all trace of a subarachnoid space was obliterated, the vessels of the pia mater appearing to ramify upon a smooth surface. The cerebral hemispheres were not symmetrical, the left being the largest; the corpus callosum was bulging outwards, and upon being cut into to expose the ventricles nearly three ounces of clear serum escaped. The septum lucidum was destroyed, and the central parts were soft. The left corpus striatum and thalamus were thrust upwards into the ventricle. At the anterior part of the left hemisphere, and in front of the fungus, was a large encysted abscess, about the size of a hen's egg; its walls were dense and tough, and it contained pus of ordinary consistence and colour, and free from all smell. The cyst was perfectly globular, one eighth of an inch thick, and consisted of a tough semi-transparent membrane of nucleated fibres; the interior was smooth and hard, and not unlike the surface of an old vomica in the lung; externally it was distinct from the brain-substance, and the latter fell off it by gravitation when it was held up. The brain-structure round it was of various hues, between a dead white and brown, several ochry patches being seen around.

The abscess was covered in by at least an inch of brain-structure.

The base of the middle hemisphere showed evident symptoms of old contusion and extravasation; the convolutions were of an ashy colour, from effused blood.

In this exceedingly interesting case of compound fractured skull, followed by an encysted abscess of the brain, it is curious to observe how the process of repair had gone on, even to the healing of the external wound and union of the fractured bones. The cerebral injury was doubtless the cause of death; and although this case invites comments, I must forbear, as my object in quoting it is merely to show a result of a local injury to the brain associated with compound fracture.

The primary results of the accident were very lasting; and the symptoms of arachnitis well marked. The benefit of venesection was well illustrated by the gradual subsidence of all symptoms of inflammation of the membranes.

The inflammatory changes going on in the hemisphere producing the abscess had probably been progressing for some time, and the uncertainty and irregularity of the symptoms well displays the insidious character of such a complication.

Case xxxiii.—Fractured Skull; Depressed Bone; Laceration of the Dura Mater and Ecchymosis of the Brain; Arachnitis, and Death.

A boy, æt. 7, in a quarrel with his mother received a blow upon the left parietal bone from the end of a poker which she threw at him; no symptoms appeared after the accident, and he went about as usual, but upon the second day, or about forty-eight hours after the injury, he became drowsy, and was consequently brought to the hospital. He was admitted partially unconscious, with a hot skin, contracted pupils, and evident early symptoms of arachnitis; there was also a punctured wound of the scalp, with depressed bone, over the left parietal bone. Mr. Cock trephined the part and raised the depressed bone, which was quite loose and driven in. The membranes were torn through, and brain-matter showed itself. The symptoms, however, continued, and he died comatose three days after his admission, and the fifth after the accident.

At the post-mortem examination, brain-matter was seen protruding through a small circular hole in the left parietal bone. Upon removing the calvaria, acute purulent arachnitis was seen covering the whole brain, and extending downwards to the base, which was equally involved.

The brain itself corresponding to the wound was ecchymosed and soft; in other parts it was healthy and uninjured. The other viscera were healthy.

In the cases just quoted fracture and depression of bone were produced by a direct blow, accompanied with injury to the dura mater and brain at the seat of fracture alone; there was no great shaking or concussion of the brain to cause laceration of its structure and extravasation, but a purely local injury. Arachnitis and softening of the brain, where bruised, followed, and with it the death of the patient. Such an inflammation is almost a constant consequence of any real

laceration of the membranes, or of the brain-structure, whenever it occurs, either from direct injury, as in the case just quoted, or in others produced by a severe concussion by *contre-coup*.

It remains to quote an example or two of extreme local injury to the brain, followed by the same arachnitis and death.

Case xxxiv.—Compound Fractured Skull; Escape of Brain-matter; Arachnitis, and Death.

A railway guard, æt. 34, when travelling in a third-class railway carriage, lent forwards out of the window and received a blow against an archway, when the train was in moderate motion and about to stop. He got out of the carriage and walked into the station, and was at once brought to the hospital. He was admitted without a brain-symptom, and perfectly rational, with extensive wound over forehead, and comminuted fracture of the frontal bone; the brain-substance was also freely exuding. Some dozen or more pieces of bone were removed by Mr. Forster, and water-dressing applied to the wound. He soon, however, became drowsy, and this steadily passed on to coma, followed by marked symptoms of arachnitis, and death upon the fifth day.

Upon removing the calvaria, a round hole, the size of a crown, was seen in the frontal bone, the inner table being fractured much more extensively than the outer. The frontal sinuses were opened, and the fracture extended through the ethmoid bone, and *longitudinally* through the body of the sphenoid and basilar process of the occipital to the foramen magnum.

Beneath the opening in the frontal bone the dura mater was torn through, and brain-matter, mixed with blood and lymph, freely exuded.

Upon removing the membranes no pus was seen beneath, but the brain was contused and pulpy, particularly at the anterior edge of the *right* lobe, and this softened condition extended into the medullary substance. The *left* lobe was less contused, but in one spot the brain was breaking up, and in another blood had been effused.

Upon the right side of the brain was acute arachnitis, with lymph completely covering the arachnoid.

The ventricles were healthy, and also the viscera.

This instance well proves to what an extent the brain-surface may be injured, and the functions of the brain left undisturbed, for as long as the central ganglia are uninvolved the vital functions are not materially affected. The subject of the injury in the case just quoted was not rendered even unconscious by the violence done to the anterior portion of the brain, and it was not till secondary inflammatory mischief appeared that any marked disturbance of the cerebral functions became manifest.

This secondary inflammation is the one point always to be feared in all injuries to the brain or its membranes; it may follow a slight concussion or the severest injury; and it is from such a complication that the majority of injuries to the cranium and its contents terminate fatally.

Case xxxv.—Compound Fractured Skull from a Pistol-shot Wound; Destruction of the Upper Surface of the Central Hemisphere; Secondary Inflammation of Brain and its Membrane; Death.

A man, æt. 35, having for some years shown some symptoms of insanity, attempted suicide by firing a loaded pistol off close to the right temporal region. He was admitted into Guy's, under the care of Mr. Birkett, soon afterwards, with a lacerated scalp-wound over the right temple, and fractured skull; the patient was quite sensible, and besides the local injury there were no symptoms of injury to the brain. Upon the day following some slight febrile symptoms appeared, but still no cerebral disturbance; upon the second day, upon examining the wound, a sharp edge, previously regarded as being bone, was found to be the edge of a bullet; this was extracted, and found to be almost separated in two; one of the cut surfaces was jagged and the other smooth, so it appeared that it had been fired against a sharp edge of the fractured bone, and this caused its separation. As it appeared probable that some loose portions of bone might be injuring the brain, the trephine was

applied, and some small pieces of bone removed. The dura mater was then seen to be lacerated and brain injured.

On the third day the man was somewhat drowsy, although quite intelligent; febrile disturbance still existed; pupils natural. On the fourth day he was attacked with two different seizures of general convulsions and obstinate hiccough; these passed away, and left him drowsy, but sensible. On the fifth day he was more dull, and pupils were dilated. On the sixth he became quite sensible, speaking to his dresser, and there was no paralysis; coma, however, came on, and death in one hour.

Autopsy.—On the right temple there was a wound three inches long, and the edges were sloughing. Upon removing the scalp, a brown decomposing mass protruded through the bone. This opening was of an oval form, an inch and a quarter long by three quarters of an inch broad, including a small piece of the anterior inferior angle of the parietal and frontal bones just above the sphenoid.

The laceration of the dura mater could not be well defined, owing to the sloughing which had taken place. The brain beneath the injury was of a brown and greenish colour, in fact, only a slough, within which was a small loose piece of bone about the sixth of an inch in diameter; upon dividing the hemispheres, nearly the whole of the right was sloughing and infiltrated with blood, involving the anterior and outer walls of the lateral ventricles, and the internal surface was stained with blood. The corpus striatum and thalamus were uninjured.

There were some small pyæmic abscesses in the lungs as well as in the liver.

Like the last case quoted, we find that a considerable local injury to the brain-substance, even with loss of cerebral material, was unaccompanied with any marked disturbance of the cerebral functions; and, like the last, the fact may be accounted for by the central nervous ganglia and base of the brain being left comparatively sound.

In both, however, secondary inflammation followed in the injured parts, and subsequently softening and extensive destruction; in this last example, however, the mind was clear to about one hour previous to death. The convulsions upon the

fourth day indicated meningeal complications, and the hiccough is a symptom worthy of remark, as it is not an unusual symptom of cerebral disease, and when of a very obstinate character should always lead the practitioner to suspect brain-disease, and accordingly direct his attention to that quarter.

H. *Fracture of the base of the skull.*

The consideration of the subject of fracture of the base of the skull now claims our attention; not because the principles which apply to the other injuries to the cranium and its contents are not applicable to such cases, but because such injuries have symptoms and results which are somewhat peculiar to themselves.

A fracture to the base alone is of no more consequence than a fracture of another part, if it should be unassociated with any injury to the brain itself; but as the base of the brain is the most delicate, and any injury to it is sure to be followed by severe, if not fatal, symptoms, the subject of fracture of the bones upon which it rests becomes proportionably of interest.

A fracture of the base of the skull may be associated with all the intracephalic injuries which have been illustrated in the previous pages; it may be complicated with simple concussion of the brain, or with the severer form associated with laceration of the brain-structure, or extravasation of blood upon or within the brain itself. If blood is effused there may be compression of the brain and death, and the same end may be produced by a secondary inflammation of the membranes and injured parts.

Upon the whole, it is difficult to separate the two classes of cases, as the dangers arising from injuries to the skull do not depend upon the seat of fracture, but upon the injuries to the cranial contents; and as the same injuries may be produced, or rather may be associated, with fractures of the base, the complications and dangers are the same in each.

Having, then, so far stated that the dangers of all forms of fracture of the skull are really alike, and that the same intracephalic complications attend fractures of the vault as of the base, I will now proceed to illustrate the special symptoms

which are generally regarded as being diagnostic of such injuries, by the brief analysis of cases from my note-book.

Amongst thirty examples which my note-book produces there are twelve cases associated with simple concussion, and in all recovery took place. In three cases the fracture extended through the orbit, as indicated by subconjunctival ecchymosis. In eight examples there was hæmorrhage from the ears; in all this was followed by a discharge of serum, and in seven cases associated with paralysis of the facial nerve upon the same side. In these cases it is quite fair to conclude that the line of fracture extended through the petrous portion of the temporal bone. In two instances there was bleeding from the nose. In one case there was a serous discharge from the ear, accompanied with paralysis of the facial, and in one following hæmorrhage from the ear, but unaccompanied with paralysis.

To test the value of these different symptoms, as indicating fracture of the base, in various positions, the following analysis of the fatal cases will prove of value; and, taking the symptoms separately, subconjunctival hæmorrhage will first claim our attention, as being a symptom tolerably accurately marking a fracture through the orbital plate. In the eighteen fatal examples this symptom was manifested in four instances; in one and all the line of fracture extended through the orbit.

In two cases there was copious hæmorrhage from the ear; in both these the fracture passed through the petrous bone.

In three examples there was some epistaxis; in one of these the fracture extended across the ethmoid bone; in one the frontal sinuses were full of blood and fractured; and in the third the tympanum was found full of blood and the membrana tympani perfect, and upon careful examination the lateral sinus of the brain was found to have been lacerated.

Seven of the eighteen fatal cases died from direct injury to the brain, the post-mortem examination in all revealing severe contusion or laceration of the brain-structure, with effusion of blood upon the surface of the brain or upon the membranes.

Another seven cases died from arachnitis as a result of the injury, in four of these there being contused brain, and in one ecchymosis of the ventricles; in two cases there was no evidence of contused brain, nor was there any effusion of blood; in one interesting case the inflammation spread from the internal ear.

In three the cerebral mischief was complicated with some thoracic or abdominal injury, which caused death; and in one instance hæmorrhage was the immediate cause of death.

With this brief analysis of the cases I will quote a few of the most interesting examples.

CASE XXXVI.—FRACTURED BASE; SPINE DRIVEN INTO THE CRANIUM; BRAIN EXTENSIVELY BRUISED AND LACERATED.

A labouring man, æt. 36, in falling off a scaffolding, pitched upon his head; he was taken up perfectly unconscious, and brought to this hospital, where he died a few seconds after admission.

Upon examining the body after death, it was clear that the weight of the body, as conveyed through the spine, had completely driven the spinal column into the skull, the base, for about one inch round the foramen magnum, being detached and pressed inwards upon the brain; this was much lacerated and contused from the pressure of the displaced bone; fissures radiated upwards from this spot.

This is a most marked instance of fracture from so-called *contre-coup*, and is given here as illustrating the only method by which such an accident could take place; the vertex, upon which the man alighted, was uninjured, but the whole force was concentrated on the body, and conveyed through the spinal column to the skull; it is in reality, however, a direct application of the force and not a result of *contre-coup*, which consequently can never produce a fracture.

It is hardly necessary to quote cases illustrating contusion or laceration of the brain from *contre-coup*. This is the most frequent cause of injury to the brain, with or without extravasation of blood upon the surface.

In no less than fourteen instances of the eighteen fatal cases did this complication take place, and in those examples where the brain was contused at the seat of fracture the brain at the opposite side of the skull was, as a rule, found in a more injured condition.

When blood is effused upon the surface of the dura mater, there is generally found some effusion within the mem-

branes or some injury to the brain. Amongst the seven instances where this effusion was detected, in five there was also effusion of blood within and upon the surface of the brain. In the other two cases arachnitis was the cause of death.

CASE XXXVII.—FRACTURED BASE, ASSOCIATED WITH COPIOUS HÆMORRHAGE FROM THE NOSE, NONE FROM THE EAR; LACERATION OF BRAIN BY CONTRE-COUP; SEVERE FRACTURE OF BASE; LACERATION OF LATERAL SINUS; COPIOUS HÆMORRHAGE FROM NOSE AND MOUTH; MEMBRANA TYMPANI ENTIRE.

A man, æt. 52, fell from a height of thirty feet upon his skull; he was rendered completely unconscious, and when admitted into the hospital was in a dying condition, blood flowing rapidly from his nose. He died two hours after the accident.

Autopsy.—Beneath the scalp much blood was effused; upon the *left* side of the skull there was an extensive fracture. The petrous portion of the temporal bone was completely separated from the mastoid, and squamous; the fracture in front extending partly into the sphenoid in the middle fossa, and posteriorly passing across the groove for the lateral sinus where formed by the parietal and mastoid bones; it then extended across the parietal, crossed the sagittal suture at its centre, and nearly reached the frontal bone. There was considerable effusion of blood into the pia mater, especially upon the *left* side and at the cerebellum; the velum interpositum was filled with blood. In the posterior lobe of the left cerebrum there was a laceration, three inches in length, extending through the gray matter (by *contre-coup*). A small laceration was observed also near the vertex. The right lateral sinus was also torn. The right tympanum was full of blood, but the membrana tympani was entire. The stomach was full of blood, which had been swallowed. Other viscera were healthy.

This case is a good illustration of fracture of the base and injury to the brain from a severe shake, as produced by a fall from a height upon the head. The fracture radiated from the seat of injury, and caused absolute separation of the left petrous bone; the left cerebrum was severely lacerated by

contre-coup, and blood extensively extravasated into the pia mater. The one marked symptom of severe epistaxis is interesting, connected with the absence of hæmorrhage from the ear, and the perfect condition of the membrana tympani, the blood having probably found its way from the tympanum through the Eustachian tube, thus causing severe epistaxis, and filling also the stomach with effused blood.

CASE XXXVIII.—FRACTURED BASE; SEVERE HÆMORRHAGE FROM THE RIGHT EAR, AND SUBCONJUNCTIVAL ECCHYMOSIS; LACERATION OF CAROTID ARTERY AND LATERAL SINUS; LUNGS FILLED WITH BLOOD; DEATH FROM HÆMORRHAGE.

A man, æt. 30, when at work, ropemaking, had his head jammed between two cog-wheels; he was rendered perfectly unconscious, and was admitted in this condition, bleeding copiously from the right ear, with subconjunctival ecchymosis, and in a dying condition. He lived two hours only after the accident.

After death there were no external signs of injury; upon removing the scalp the calvaria presented a marked disposition for the bones to separate at the coronal suture. The base of the skull was fissured in all directions, a fracture extending across the ethmoid and orbital plates and basilar process. The left carotid artery had been lacerated in the temporal bone, and the left lateral sinus was also opened; the membrana tympani upon the left side was also ruptured. The brain was uninjured, and there was no effusion of blood between the membranes. The lungs were filled with blood, and also the bronchial tubes, the air-cells being full.

There was no doubt, in this case, that death had resulted directly from hæmorrhage, the source being the ruptured carotid artery; the bleeding from the ear was very profuse, and it is very probable also that blood passed down the Eustachian tube, and thus passed into the lungs, the nervous system having been so paralysed as to lose its power, and thus allowing the glottis to remain patent.

In this case there was no injury to the brain, the accident

having been produced by compression of the base, and the brain consequently received no shake.

In the cases already quoted, severe lacerations of the brain, contusion of the brain, hæmorrhage from the ears, nose, and beneath the conjunctiva, have been illustrated as direct symptoms of fracture of the base. In the following example a secondary result is to be represented, death having been caused by arachnitis.

CASE XXXIX.—FRACTURED BASE OF THE SKULL; CONCUSSION; EXTRAVASATION OF BLOOD EXTERNAL TO THE DURA MATER; ARACHNITIS, EXTENDING FROM INTERNAL EAR; DEATH.

A carman, of temperate habits, æt. 35, when at work was prostrated by a pocket of hops falling from a height upon him; he fell out of the cart upon the left side of his head. He was admitted into Guy's under the care of Mr. Hilton, insensible, with a slight wound over left frontal bone and temple, and with ecchymosis of the eyelids; during the following night his intelligence returned, and he answered questions when roused, but at times he muttered incoherently. During the first day he began to vomit, pupils became contracted and breathing stertorous, but there was no paralysis; his head was shaved, and a good enema given. The second day he was very restless, skin hot, and pulse quick; he asked for what he wanted; there was slight paralysis of the left facial nerve.

Hyd. c. Cret., gr. iij;
Pil. Dov., gr. v; bis die.

The *third* day he was improved, tongue was moist, and skin less feverish; pulse 60, soft. On the *fourth* day he had passed a restless night, being slightly delirious; he answers when spoken to, but was very drowsy; skin hot, tongue much furred, but moist; pulse hard and full.

Julep. Ammon. Acetat. c. Vin. Ant. Tart., ℥xx, 4tis horis.

On the *fifth* day the tongue was much drawn to the right side, the left side being paralysed; pupils were unequal, left dilated, right contracted, the left being scarcely sensible to

light. On the *sixth* day his delirium became more marked, and he complained much of pain in his head. On the seventh day there was strabismus of the *left* eye, and the symptoms of arachnitis were more marked, delirium increased and coma followed, the man dying upon the tenth day.

Upon post-mortem inspection, the left side of the scalp was found to be extensively ecchymosed. Upon removing the calvaria an extensive fracture was detected; the squamous portion of the left temporal bone was fractured in several parts anteriorly, so that a square piece, one inch in measurement, was quite moveable, but not depressed; from this a fracture extended obliquely across the parietal as far as the occiput, almost reaching the base; a second passed across the petrous portion of the temporal bone, from the foramen spinosum, about one eighth of an inch external to the internal auditory canal, and terminated at the posterior lacerated foramen. The middle meningeal artery was divided upon the left side, and a layer of blood, a quarter of an inch thick, placed between the bone and the dura mater. Upon removing the dura mater, the arachnoid was found drier than natural, but the pia mater was deeply injected over both hemispheres. At the lower part of the cerebellum the pia mater was infiltrated with pus, which also completely surrounded the medulla oblongata, the eighth and ninth pairs of nerves, the pons varolii, and reached to the subarachnoid space; a thick layer of lymph also surrounded the optic commissures. The brain was firm and injected. The ventricles contained about ʒiij of slightly opaque serum. Upon examining the internal ear, it was found filled with pus, the fracture having passed through the labyrinth. The membrana tympani was entire; the facial nerves softened.

The preceding case affords an interesting example of fracture of the base without any primary diagnostic symptoms, the line of fracture having, in the anterior and middle fossa, missed the orbit and the middle ear with the tympanum. The cerebral symptoms were at first only those of concussion of the brain; when reaction was established, after about twenty-four hours, vomiting occurred, with paralysis of the facial nerve; symptoms of arachnitis then made their appear-

ance, followed by paralysis of the tongue and strabismus, indicating some mischief to the roots of the nerves at the base. Other symptoms of effusion set in, followed by coma and death upon the ninth day.

The autopsy revealed the true source of all the mischief. There could be little doubt that the arachnitis had spread from the internal ear along the nerves to the general arachnoid, and, involving the nerves of the base, had produced strabismus, paralysis of the tongue and face, coma, and death.

The fact that there had been considerable effusion of blood external to the dura mater from rupture of the meningeal artery is worthy of note, not being connected with any paralysis; and although the clot was at least a quarter of an inch in thickness, and the brain consequently compressed to that extent, it maintained its functions, tending to prove what all experience of injuries to the brain indicates, that local mischief, although severe, may produce but very slight, if any, symptoms, but that general injuries, although slight, may be, and generally are, followed by the worst symptoms.

Having now carefully considered the whole subject of concussion and injuries to the brain, including compression and the extravasation of blood, associated or not with fracture of the skull, the following inferences may, I believe, be fairly drawn:

1. That injuries to the skull are of importance only in as far as they involve the cranial contents; that the local mischief is of small importance compared with the intracranial; and that uncomplicated fracture of the cranium is seldom followed by any injurious symptoms compared with any general injury to the cerebral structure.

2. That a *slight* concussion of the brain, whether associated with a fracture of the vault or base of the skull or not, will generally do well, and will be known by only a slight or temporary suspension of the cerebral functions, independent of the symptoms of local injury.

3. That a *severe* concussion of the brain, whether associated or not with fracture of the vault or base of the skull, is liable to produce primarily contusion or laceration of the brain-structure, either upon its surface or within its ventricles; that

extravasation of blood may also take place, either upon the brain or within its structure; and that, consequently, if the *primary* effects of the accident do not cause a fatal termination, a *secondary* encephalic inflammation probably will.

4. That *contre-coup*, the result of a severe shaking or concussion of the brain, produces severe contusion and laceration of the brain, and with such, extravasation of blood; but that *contre-coup* never yet produced fracture of the skull, and it is doubtful whether it ever produced a rupture of the middle meningeal artery, and, as a consequence, extravasation of blood upon the dura mater and compression of the brain.

5. That *a fall upon the vertex from a height, or a blow upon the head from a blunt instrument*, may be followed by fracture of the skull, or otherwise; but such an accident produces, as a rule, a general concussion of the brain, and with this may be associated any of its complications, such as contusion or laceration of the brain, either upon its surface or within the ventricles, and consequently with effusion of blood.

6. That *falls upon a pointed object, and blows with a sharp instrument*, as a rule, are followed by a local fracture; and that if the brain is injured, it is at the seat of injury. As a consequence, the symptoms may be accounted for by local causes only, and the primary treatment to be adopted must be directed by local considerations.

7. That when symptoms of *compression of the brain* immediately follow an injury to the skull produced by a *fall from a height, or a blow from a heavy and blunt instrument*, the cerebral injury, as a rule, will be general, and the brain will subsequently be found contused and lacerated, particularly at the base, by *contre-coup;* and that if extravasated blood should be found external to the dura mater, blood will also be found upon the surface of the brain, or within its membranes.

8. That if symptoms of *compression of the brain* follow a *local injury produced by a fall upon a sharp object, or a quick blow from a pointed one*, that such symptoms, as a rule, are produced by *local causes*, such as depressed bone, or extravasation of blood from rupture of the middle meningeal artery.

9. That such *local injuries*, when giving rise to general symptoms, should be treated by elevation of the bone, if depressed; but if no general symptoms are present, unless

the bone is comminuted and can be easily removed, no operation is indicated; a local pressure of the brain alone, when uncomplicated with symptoms, generally doing well.

10. That when *compression of the brain* follows as a secondary result of *a local injury* over the course of the meningeal artery, that is, after an interval of time, when reaction has been established, although no depressed bone may be present, it is probably produced by a rupture of one of the arterial branches; the operation of trephining may then be performed with a chance of success, although it is rare to find a very local extravasation, the blood generally passing downwards towards the base, where the operator cannot reach.

11. That when *compression of the brain* follows, as a secondary result, *a general injury*—although that compression is evidently produced by extravasation of blood—the operation of trephining is useless, if not injurious; for although blood may be effused from rupture of a meningeal artery, there will certainly be found some contusion or laceration of the brain itself, or extravasation within its membranes, which the operation cannot relieve, but is sure to increase.

12. That *encephalic inflammation* may follow any concussion or injury to the brain, however slight, whether complicated with fracture or otherwise; and that the danger of such a result is in proportion to the encephalic injury. In cases of contusion or laceration of the brain, with extravasation of blood, it is almost sure to follow, and, as a rule, it will produce a fatal termination. This inflammation may appear within a few hours of the accident, or it may be postponed for some days; it may be very rapid in its course, or very insidious in its nature. If the brain itself is the seat of the disease, it is generally insidious, and either a diffused or local abscess will subsequently be detected; but if the membranes are involved, effusion, coma, and death will rapidly take place.

13. That the *operation of trephining* is perfectly useless in cases of severe concussion of the brain, whether associated or not with fracture, although it may relieve compression of the brain from local conditions; for the brain is generally injured by *contre-coup* at its base, or in positions where no operation can be of benefit, but must prove injurious.

14. That the *operation of trephining* may prove of value

in *local injuries* to the skull or brain, when associated with symptoms of compression and depression of bone, or from the local extravasation of blood. In the former case, when the brain and membranes are uninjured, success may fairly be anticipated; but in the latter, the chances are decidedly against it, as blood, if effused, is seldom local, but passes downwards towards the base.

15. That fractures of the *base of the skull* may take place alone, and be marked by only special symptoms; that they may be associated with, and are generally found in, all severe fractures of the vault, when produced by a heavy fall or blow, the fissures radiating downwards in a direction parallel to the forces employed.

16. That *fractures of the base* may be complicated with encephalic injuries similar to the fractures of the vault, and may consequently be manifested by general symptoms as well as special ones, in severe cases the former completely masking the latter; the injury, however, may generally be diagnosed, the mode of injury indicating the probability of its occurrence.

CHAPTER III.

INJURIES TO THE SPINE.

The close analogy which exists between the brain and spinal marrow, anatomically and physiologically, is completely carried out in their pathology; and the consideration of the results of injuries to the latter is much simplified when the former is well understood. In former pages the results of injuries to the skull and its contents have been carefully illustrated by cases, together with the chief complications, and the symptoms indicating the various pathological conditions which are found in practice. It has been shown that the functions of the brain may for a time be interfered with or suspended by a simple shake or concussion of its substance; that a severe concussion may be found associated with contusion of the brain and extravasation of blood, either upon its surface or within its structure; that fractures of the skull are of importance in proportion to

the amount of encephalic complications; and that inflammation of the nervous structure tself, or of its membranes, is too frequently the result of any such injuries, however slight.

When we approach the consideration of the injuries to the spine and its contents, precisely similar results can be deduced. It can be shown that the functions of the cord may be interfered with or paralysed by a simple concussion, and that in severe instances capillary ecchymosis of the nervous structure, or extravasation of blood within the membranes, may also be produced.

Examples may be quoted illustrating the complete or partial disorganization of the cord from the displacement of a fractured or dislocated vertebra, and also others showing the results of inflammatory action following upon any injury.

The secondary results also of injury to the spine, as shown by complete paralysis of all its functions, from a chronic inflammatory change in the tissues of the cord, could also freely be illustrated; but as these secondary cases come more under the notice of the physician, they will claim only this passing notice.

Space will hardly allow me to quote many examples of each complication, nor is it necessary to do so; the thoughtful practitioner will soon understand how such injuries are produced, and by what symptoms they will be manifested; the consideration of the functions and position of the cord will indicate to him the result of any injury to its structure, and will point out the symptom by which such injuries can be diagnosed. A simple concussion of the spine may produce a partial or complete suspension of the cord's functions; by rest and quiet these symptoms may disappear, and a perfect recovery take place. A more severe concussion may be associated with some injury to the nervous structure, or some extravasation of blood upon or within the cord itself; such a complication will necessarily be associated with more marked symptoms, and partial or complete paralysis and anæsthesia will be present, varying according to the extent of the mischief and the seat of the injury.

When the spine is fractured or dislocated, like complications may be produced—the cord may receive a simple concussion, or a more serious form of injury may be the result.

The cord may be completely pulped by pressure, or injured to any extent from even a slight bruise, and the symptoms

indicating such a mischief will vary from a partial to a complete destruction of its functions.

Following any one of these injuries, an inflammation of the cord or of its coverings may be excited, and with it the peculiar symptoms and results of such an action.

My notes yield me twenty-five good examples of simple concussion of the spinal cord, either of the cervical, dorsal, or lumbar region, produced by a fall upon the back in either of the above regions. The symptoms produced varied to a great extent; more or less paralysis of that portion of the body supplied by nerves emanating from the injured centre was the chief symptom, and anæsthesia, or loss of sensation, was present in almost all the instances. Retention of urine, also, was a common complication. In sixteen of these instances by simple rest these symptoms gradually disappeared, and a perfect recovery ensued.

In three cases the paralysis, &c., was complicated with severe local pain over the seat of injury, and by the application of a cupping-glass and local bleeding this was relieved, followed by convalescence.

In one case recovery was very slow, and convalescence was hastened by the man being electrified over the spine.

In another example pain in the partially paralysed limbs followed the injury, indicating some excess of action in the centre; and some slight mercurial, in the form of the Hyd. c. Cret. c. Pulv. Dov., ana gr. iij, was given twice a day with marked benefit, pain disappearing and a cure taking place. In one case the paralysis and loss of sensation of the whole body below the neck was perfect, and the concussion was so severe as to completely paralyse the spinal centres, allowing an involuntary discharge and constant flow of urine; this lasted for about twelve hours, when power of the limbs gradually returned, followed by steady convalescence.

It is thus seen that in the simplest form of concussion of the spine there is but slight paralysis and loss of sensation of that portion of the body supplied with nerves from the injured centres. That in more severe cases there is some retention of urine, arising from the loss of voluntary power over the muscles which regulate micturition. That in still more perfect examples of concussion the paralysis and anæsthesia of the body

may be perfect, and associated with absolute paralysis of the bladder and all its muscles, allowing the flow of urine from its cavity as secreted. (This condition of the bladder must not be confused with the involuntary discharge of urine from an over-distended viscus, which may be seen in the former and simpler class of cases.)

In all cases such as these, if a subsequent inflammatory condition does not take place, a perfect recovery may ensue, as all these symptoms may be produced without any permanent change or injury to the nervous structure.

The treatment most beneficial is that which succeeded in the examples already quoted, perfect repose in the horizontal position being absolutely essential.

In instances where severe local pain is present, the application of a cupping-glass, with or without the extraction of blood, will be found of benefit. When there are symptoms of excess of reaction, some mild mercurial, such as the gray powder or the bichloride, should be employed, and the local application of a blister is often advantageous. In those cases where recovery is very slow, unattended with any symptoms of inflammatory action, electricity applied to the spine and muscles involved should also be advised, and under these simple means recovery may generally be expected.

CHAPTER IV.

FRACTURES AND DISLOCATIONS OF THE SPINE.

The spinal cord, like the brain, is so carefully protected from injury by its osseous covering, and any slight injury to its delicate structure is so sure to be followed by severe symptoms, that it can be no subject of surprise that fractures and dislocations of the spine are injuries of a very grave nature, and that it is rare for such accidents to take place without the cord itself being more or less involved. The clinical experience of Guy's Hospital for the last five years fully bears out this idea; for out of twenty-four examples of fracture and dislocation of the spine, three only have escaped with their lives; and the functions of the cord in these instances had not perfectly been restored.

I have classed fractures and dislocations of the spine together, as these accidents are frequently combined. It has been generally taught that the latter form of accident is exceedingly rare, but my own experience leads me to believe such an opinion to be erroneous; for amongst the twenty-four cases which my notes yield me, including all the examples of such an injury to the spine admitted into Guy's during the last five years, six are cases of pure dislocation of the spine, three of fracture, and eight of fracture and dislocation combined; and the fact in these seventeen examples was verified by a post-mortem examination. In the remaining seven cases a fracture was diagnosed, but not proved.

Of these seventeen cases of fracture and dislocation of the spine, in which a post-mortem examination was made, in ten the seat of injury was in the cervical region, in seven in the dorsal.

Amongst the injuries to the cervical region—

Five were pure dislocations, two between the fourth and fifth cervical, two between the fifth and sixth, and one between the seventh cervical and first dorsal.

Five were dislocations and fractures combined; in each the body was dislocated forwards from the one below, the articular processes were separated at their joints, and in each there was a fracture through the spinous processes or laminæ of the dislocated vertebræ, the dislocation taking place at the lower surface of the third, fourth, fifth, sixth, and seventh vertebræ respectively.

Amongst the injuries to the dorsal region—

One only was a pure dislocation, taking place between the eleventh and twelfth vertebræ; the ligaments confining all the joints were ruptured, and the body of the eleventh thrown forwards.

In three the eleventh dorsal vertebra was dislocated forwards from the twelfth, tearing through the inter-vertebral substances, and associated with fracture of some portion of the arches of the lower vertebræ; the articular surfaces, however, in all instances, being singly or doubly dislocated.

In the three remaining instances a fracture alone existed. In one the fourth and fifth were comminuted; in one the eighth, ninth, and tenth were fractured through the bodies and laminæ; and in the third the twelfth dorsal with the three first lumbar were extensively fractured.

In the remaining seven cases all were in the dorsal region, and about the tenth, eleventh, and twelfth vertebræ; and three of these recovered.

From the preceding analysis it would appear—

1. That injuries to the spinal column are more frequent in the dorsal than in the cervical region, but only in the proportion of 58 to 41.

2. That in injuries to the cervical region simple dislocation of the spine is as frequent as the combination of dislocation with fracture. That in all such injuries the intervertebral substance is torn through, the upper vertebra being, as a rule, thrown forwards; and that where fracture takes place it is generally at the spinous process, and not in the bodies.

3. That such dislocation may take place between any of the bodies of the cervical vertebræ; that between the fourth, fifth, and sixth being the most common.

4. That in injuries to the dorsal region pure dislocation is very rare, although it may occur; that such injuries generally take place between the tenth, eleventh, and twelfth vertebræ; that the body of the superior is generally dislocated forwards, and the body of the inferior is as generally fractured; and that some portion of the arch of the inferior vertebra is, as a rule, broken.

Having carefully considered the condition of the spinal column after injury, and the form of accident which is most likely to occur, we will now proceed to the consideration of the condition of the cord itself, and we shall find that such accidents are generally complicated with very serious and destructive changes within its structure.

Amongst the twenty-four examples there were nineteen in which there was most perfect paralysis below the seat of injury immediately after the accident; in eighteen of these there was also perfect anæsthesia, and in one hyperæsthesia.

In two cases there was no paralysis at the time of injury, but when reaction set in paralysis appeared.

In one case there was no paralysis or injury to the cord.

In two the paralysis was but partial, and both recovered.

The condition of the cord in seventeen cases in which a post-mortem examination was made revealed the fact—

That in one case the cord was completely divided at the seat of injury, the ends being one inch apart.

That in eight instances the cord was completely crushed, and in all these perfect paralysis had been present below the seat of injury.

That in four cases the cord was bruised, blood being extravasated within its structure. In all these cases there was paralysis, and in all the injury was in the cervical region. In one of these hyperæsthesia existed.

In two cases the cord was found uninjured, but in one of these there was secondary paralysis from the effusion of blood external to and within the membranes.

In two instances the cord was found softened from inflammatory action, the patients surviving the injury ten and sixteen days. In both of these cases there was secondary paralysis—in one after the period of reaction had taken place, and in this blood was effused within the membranes compressing the cord; in the second there was also effusion of blood external to the membranes.

In three cases only was blood found effused within the membranes; in two of these the cord was sound, and in both secondary paralysis took place; in one there was paralysis after the injury, and blood was found effused within the cord itself.

In two instances only was blood found external to the dura mater; in one of these secondary paralysis existed upon the fourth day, and the cord was found softened from inflammatory action, and in the other it was associated with hæmorrhage within the membrane and compression of the cord.

It appears, then, in addition to the conclusions given in the last page—

5. That a fracture or dislocation of the spine may take place and the cord remain uninjured; that such an escape is quite exceptional, and that, as a rule, the cord is seriously involved.

6. That in at least seventy-five per cent. of all cases of fracture or dislocation of the spine the cord is irreparably injured and disorganized, either by the primary mechanical pressure of the dislocated bone, or by the effusion of blood within its structure.

7. That in the remaining twenty-five per cent. the injury may be partially or wholly recovered from, there being no disorganization of the cord; temporary, perfect, or partial paralysis may be present, and unless some secondary inflammation take place, a recovery may follow; in these cases it is fair to believe that the cause of the paralysis is merely some extravasation of blood external to the cord.

Having thus far dwelt upon the pathology of this interesting class of injuries, it may not prove without advantage to consider briefly the duration of life and some of the symptoms and causes of death; and reviewing the ten examples of injury to the cervical region, it appears that in two only was life prolonged beyond forty-eight hours after the accident; in one of dislocation between the fourth and fifth vertebræ, with disorganization of the cord, the patient survived but thirteen hours; five lived only thirty-six, and two forty-eight hours. In all these the disorganization of the cord had taken place opposite the fifth or sixth vertebra.

In two examples the injury to the spine and cord corresponded to the seventh cervical; one of these lived seventy-two hours, and the second seven days.

In all of the eight first cases the respiration from the commencement was diaphragmatic; but in the two last, at the commencement, it was not so entirely, but in one became so at the end of forty-eight hours, and the patient died twenty-four hours subsequently. In the second it became so upon the fourth day, and upon the seventh the man died.

Amongst the eleven fatal cases of fracture and dislocation of the dorsal vertebræ, eight died within eighteen days, the

most rapid death taking place at the tenth, at which period three died.

The remaining patients survived the accident 90, 134, and 232 days respectively.

8. It is fair, then, to conclude, that in injuries to the cervical spine death takes place more rapidly the higher the mischief to the cord exists, and that death generally takes place within forty-eight hours; and that when the injury is lower down, that is, below the seventh vertebra, the patient will not survive more than three days, when the respiration is also carried on through the diaphragm.

9. That in injuries to the cord in the dorsal region, if the patients survive beyond the seventeenth or eighteenth day, they may live for weeks; and that a gradual sinking, and the complication of a bed-sore, is too frequently the immediate cause of death.

I shall now proceed to quote some few examples of injury to the cord as the result of violence, selecting my cases only as they illustrate any complications of the cord itself, quite irrespective of the accident to the spinal column.

Case xl. — Fracture and Dislocation of the Spine in Cervical Region; no Displacement; Concussion of Cord; Paralysis of the Legs, Left Arm, and Sphincters, with Anæsthesia after the Accident, followed by Hyperæsthesia; Ecchymosis into the Posterior Horn of Gray Matter on Left Side, also into Anterior Horn on Right Side and into the Posterior Columns; Death thirty-four hours after the accident.

Joseph K—, æt. 33, a coal-porter, when carrying a sack of coals down some stairs, fell, with the sack of coals falling upon him. Admitted immediately after the accident, with paralysis of the legs and left arm, and also of the sphincters; there was also entire loss of sensation in the left arm as high as the deltoid; he could feel about the feet and on the outer side of the thigh, but not upon the anterior and inner surface. The seat of sensation, however, was very variable,

returning to spots where it had just previously been absent; apparently the most distant parts recovered first. There was slight priapism, and the breathing was diaphragmatic. After a few hours sensation returned in every part. As the skin became warm, he complained of pain when lightly touched. The day following, the sensibility of the surface appeared to be excessive, judging by his exclamations when the skin was touched or pinched. This was especially noticed in the right arm. Priapism, which existed when he was admitted, passed off after two hours, but returned the day following. He continued to have power to move the right arm, and died thirty-four hours after the accident.

Post-mortem examination.—Spine only examined.—There was no external trace of the injury; the membranes of the cord were healthy. Opposite the fourth and fifth cervical vertebræ the substance of the cord was contused. On section there was found ecchymosis of the posterior horn of gray matter on the left side, and of the adjacent part of the lateral and posterior columns. There were also other limited spots of ecchymosis on the right side, one in the right posterior column, and one in the anterior cornua of the gray substance. The gray matter generally was hyperæmic from venous congestion, but there was no other lesion of it except at the two spots named.

Upon examining the spinal canal, after the removal of the cord, nothing abnormal was discoverable in the bodies of the vertebræ opposite the lesion of the cord; but in dissecting off the posterior ligament it was seen that the body of the fourth was separated from that of the fifth, and that the left articular process of the fourth had been chipped off by the violent pressure of the lower against it.

The above case I have quoted at some length, as it affords an admirable illustration of extravasation of blood within the cord as the result of violent concussion; it is true the bones were fractured, but as no displacement had taken place, such a fracture could not have affected the cord.

This case has been already published by Dr. Gull in the 'Guy's Hospital Reports' for 1858, and in his remarks upon it he draws attention to "the limitation of the injury, producing paralysis of the left arm whilst the right retained the power of motion; the immediate effects of concussion on the cord, producing anæsthesia for a few hours; the return of sensibility, first, in the parts most distant from the injury; and the development of hyperæsthesia."

CASE XLI.—FRACTURE AND DISLOCATION OF SPINE BETWEEN FOURTH AND FIFTH CERVICAL; CONCUSSION OF THE CORD; RECOVERY OF POWER AFTER TWO HOURS; SECONDARY PARALYSIS AS A RESULT OF THE EFFUSION OF BLOOD OUTSIDE THE THECA VERTEBRALIS; DIAPHRAGMATIC RESPIRATION; INTENSE HEAT OF SKIN; DEATH IN FORTY-FIVE HOURS.

Robert L—, æt. 40, having fallen backwards, with a heavy plank falling upon him, was admitted into Guy's, collapsed but sensible; there was perfect paralysis of the left leg, partial of the right, and of both arms. After two hours he was able to flex his legs and grasp the hand, the skin also became warmer. No injury to the spine could be discovered. After six hours he said he was quite comfortable; he passed a restless night, and the following morning, sixteen hours after the injury, he was found perfectly paraplegic, both in the upper and lower extremities, with loss of sensation, and priapism. The ribs scarcely moved in respiration; the temperature of the skin increased; abdomen tense and tympanitic. During the day the skin became intensely hot, and the breathing wholly diaphragmatic, and he died forty-five hours after the accident.

At the post-mortem examination there was no external evidence of injury to the spine. Upon dividing the soft parts there was found a separation between the fourth and fifth cervical spinous processes, and dislocation of the articular processes. The interspinous and capsular ligaments were torn through. There was extravasation of blood outside the theca vertebralis on its anterior aspect, the effused blood compressing the cord, which was otherwise uninjured, for after careful examination there were not found any signs of bruising of its tissue. The extravasation apparently arose from injury to the lower part of the body of the fourth vertebra, which had been fractured, and the intervertebral substance torn. The

calibre of the canal was slightly encroached upon by displacement of the fourth vertebra, but not so as to press upon the cord. The extravasation, though most abundant opposite the injury, extended downwards for some distance; the membranes of the cord were uninjured.

In this instance the symptoms which first followed the injury were only such as might be produced by a concussion of the spine, and the fact that they rapidly disappeared justifies the opinion, for any injury to the centres causes more durable symptoms. With the establishment of reaction appeared paralysis, fairly indicating some compression of the cord; and the subsequent condition revealed extravasation of blood external to the membranes. The paralysis of the muscles of respiration, with the exception of the diaphragm, was the cause of the rapid death, few patients living, as I have previously shown, forty-eight hours when such a condition was in existence.

The two examples already quoted illustrate the fact that extravasation of blood, external to and within the cord, may be produced by a violent concussion. The following case will prove that the same complication may be produced by pressure upon its substance.

Case xlii.—Fracture and Dislocation of the Cervical Spine; Immediate Paralysis below the Seat of Injury; Diaphragmatic Respiration; Death in thirty-six hours; Extravasation of Blood within the Substance of the Cord.

J. W—, æt. 38, a sawyer, was admitted into Guy's, under the care of Mr. Birkett, with perfect paralysis of body and legs, and partial of the arms; there was paralysis also of the intercostals, and retention of urine. The respiration was entirely diaphragmatic, the man, just prior to his admission, having been swung into the air by an acquaintance and fallen upon his neck. The respiration became more difficult, and he died eighty hours after the accident.

After death the fifth cervical vertebra was found dislocated forwards from the sixth for about half an inch, tearing with

it a thin section of bone from the latter; the articular surfaces were dislocated and the arch fractured. The membranes of the cord were uninjured, and no blood was effused external to the cord; this was indented and softened at the seat of injury, and a section showed it to be of a dark red colour from effused blood within its substance. The lungs were gorged with blood and apoplectic; there was also effused blood along the spine, this blood probably coming from the apex of the left lung, which was injured.

Case xliii.—Dislocation of Spine in Cervical Region between Sixth and Seventh Vertebræ; Paralysis of Body below the seat of injury; Diaphragmatic Respiration; Death in thirty-six hours; Crushed Cord.

W. S—, æt. 36, when drunk, fell down stairs upon his neck, bending his head forwards. He was taken up paralysed, and admitted into Guy's under the care of Mr. Hilton. There was complete paralysis of the body and legs, and partial of the arms. No excito-motory action could be exerted. The respiration was purely diaphragmatic, and he died thirty-six hours after the accident.

Upon subsequent examination no external signs of injury were present. Upon removing the soft parts about the spine, a gap was seen between the fifth and sixth spinous cervical processes, the ligaments were ruptured, and articular surfaces completely dislocated, allowing the finger to be passed inwards upon the cord; the fifth vertebra was torn from the sixth, through the intervertebral substance; there was no fracture, and the anterior ligament of the spine was not ruptured. The medulla was crushed, and of a red colour from the extravasation of blood within its structure.

Case xliv.—Dislocation of the Fourth Cervical Vertebra forwards from the Fifth; Paralysis; Diaphragmatic Respiration; Death in thirteen hours.

G. W. D—, æt. 17, having when wrestling been thrown with his head under the arm of his adversary, was admitted under the care of Mr. Birkett, some hours after, completely paralysed

below the neck, and quite sensible. The respiration was carried on solely by the diaphragm, and he died in thirteen hours.

The muscles of the neck were infiltrated with blood, and the finger could be easily introduced between the spinous processes of the fourth and fifth cervical vertebræ. The fourth was found to be completely dislocated forwards from the fifth, tearing through all the ligaments and the intervertebral substance. The sheath of the cord was sound, but on opening it the medulla was found to be a mere red diffused mass from effused blood. The lungs were intensely congested, and in parts blood was effused into the tissue; the tubes also contained blood. The other viscera were healthy.

The two cases just quoted are fair illustrations of pure dislocation of the cervical spine with destruction of the cord, causing complete paralysis of the whole body below the seat of injury. The immediate cause of death in both was tolerably clear—the want of aëration of the blood, the act of respiration being carried on exclusively through the diaphragm. The post-mortem condition of the lungs in the latter case is one worthy of notice, blood actually being effused into the tubes as well as into the air-cells. This condition of the lungs is such as is usually found in such cases, the patient in these instances dying asphyxiated.

Case xlv.—Dislocation of the Eleventh Dorsal Vertebra, with Fracture of the Twelfth; Anæsthesia of the Sciatic Nerves, but no Paralysis; after a few hours return of Sensation, but Paralysis of both Legs, and Pain in course of the Anterior Crural; Death upon the tenth day; Blood effused round the Cord, and within the Gray Matter.

W. O—, æt. 33, a labourer, when at work was prostrated by a weight of timber falling upon his shoulders, doubling him up. He was admitted shortly afterwards with complete loss of sensation in the course of the sciatic nerves, but no paralysis. There was severe pain across his loins, and retention of urine. Upon examining the spine some displacement of the eleventh dorsal vertebra was very evident. In a few hours sensation returned,

but both legs became paralysed. The day following, the man complained of severe pain in the course of the anterior crural nerves. In another twenty-four hours all pain ceased, and complete paraplegia and anæsthesia existed, and upon the tenth day he died.

At the post-mortem examination the eleventh dorsal vertebra was found dislocated forwards, tearing through all the ligaments and the intervertebral substance, the extreme edge of the body of the twelfth only being fractured.

Blood was extensively effused round the cord at the seat of injury, the membranes were natural, and the surface of the cord was flattened and felt soft. A section showed a pulpy condition of its structure for some distance above and below the injury; the gray matter could not be distinguished, being mixed with blood and disorganized. This condition extended downwards to the extremity of the cord, and as high as the fourth or fifth dorsal vertebra.

In this case it would appear that the cord could have received but a slight injury at the time of the accident, as the only symptom was anæsthesia in the course of the sciatic nerves, but no paralysis. At the expiration of a few hours paralysis of both legs came on, and it is fair to conclude that at this time some secondary hæmorrhage took place at the seat of injury, and probably that hæmorrhage was external to the cord. At a subsequent stage perfect paralysis of the whole lower portion of the body appeared; and the post-mortem condition of the cord revealing a distinct effusion of blood into its gray matter, causing disorganization of its structure, clearly indicated the cause.

Enough examples have been quoted to illustrate the injuries to the cord which are liable to occur in cases of fracture or dislocation of the spine, and I shall now quote one instance of fracture of the spine, unattended with any injury to the cord whatever or any spinal symptoms.

Case xlvi.—A woman, æt. 49, in a fit of mania jumped out of window. She was subsequently admitted into the hospital with a severe contusion of the back and head, but no other signs of injury; she was able to walk and move her limbs in every direction, but was evidently maniacal; there was no retention

of urine or any single symptom of injury to the nervous centres. After a few days, when the maniacal symptoms had been subdued, she remained in bed, and became perfectly quiet. She lay still with her eyes closed for many days, but would occasionally rouse herself, and speak rationally. There was no paralysis, and she sunk upon the sixteenth day.

Post-mortem—by Dr. Wilks:

The calvaria was rather heavier than normal, and there was considerable subarachnoid effusion over the whole brain, lying in small pools over certain sulci. The convolutions were much wasted; the ventricles were dilated with serum; the surrounding parts wasted, and the septum was like a piece of tissue-paper, and diaphonous. The brain weighed only two pounds seven ounces.

Spine.—The last dorsal and three upper lumbar vertebræ were fractured, a fissure extending through all their bodies; but there was no displacement. The spinous processes and arches of two of the vertebræ were fractured, and blood was effused into the soft parts around, but the cord and membranes were uninjured.

The viscera generally were fatty.

This case has been given simply to illustrate the fact that severe fracture of the spine may take place, and yet no injury to the cord itself occur; it is interesting also to observe that the patient walked about freely, and yet never gave any symptoms of fracture. The wasted condition of the brain, associated with mania, is worthy of notice.

There would be no difficulty in giving the details of many cases of inflammation of the cord and of its membranes after injury; such a complication may take place from the simplest blow, concussion, or any severer accident; but it will be foreign to my purpose to enter more fully into this subject, and I can refer the reader interested in such matters to a series of papers published by Dr. Gull, in the last volumes of the 'Guy's Hospital Reports.'

CHAPTER V.

In an early page there are tabulated 82 cases of disease of the spine; in 16 this disease was in the cervical, and in 66 in the dorsal or lumbar region; in the majority it appeared to be situated in the lower part of the dorsal. In one of the cervical it was complicated with abscess, and in 47 of the remainder—

In 25 examples it opened in the course of the psoas muscle; in 9 in the right groin, and in 16 in the left.

In 20 examples the abscess was a lumbar one, and appeared about equally on both sides.

In 2 it was gluteal.

Six of these cases subsequently died, worn out by the discharge.

There are also tabulated 17 cases of spinal paralysis; in some instances the paralysis followed injury, in others no real history could be obtained.

It is not my intention to dwell longer upon this subject. In the treatment of all the spinal cases absolute rest was essentially observed; where signs of inflammatory action were present, mercurials, in the form of the bichloride, were given with tonics; and where no such symptoms were manifested, tonics alone were given. The spinal abscesses were seldom opened, and only when pain was great. I have classed all the psoas, lumbar, and gluteal abscesses under the one heading of spinal abscess, as such a term better illustrates the pathology of such affections; and to those readers who are anxious for more information upon these subjects, I must refer them to the standard works upon the subject.

DES PLAIES D'ARMES A FEU

DE L'ORBITE.

PAR

LE Dr A. BERTHERAND,

Chirurgien-major de 1re classe, Professeur des hôpitaux militaires d'instruction, Lauréat du Val-de-Grâce et des concours généraux de chirurgie militaire; Chevalier de la Légion d'honneur, Membre des sociétés de médecine de Strasbourg, de Metz, etc.

PARIS,

Chez J.-B. BAILLIÈRE, rue Hautefeuille, 19.

1851.

IMPRIMERIE DE COSSE ET J. DUMAINE,
R. CHRISTINE, 2.

DES

PLAIES D'ARMES A FEU

DE L'ORBITE.

Les effets variés, les différences si bizarres parfois que présentent les balles dans leur trajet à travers les muscles et dans leur rencontre avec les os, ne sont pas moins extraordinaires à l'égard de certains organes. Ainsi le globe oculaire et l'orbite ont été le théâtre de faits étranges, recueillis en petit nombre : notre observation personnelle, aux ambulances de l'Algérie, nous a permis d'en réunir quelques autres et nous croyons pouvoir être utile en les faisant connaître.

Tout récemment un de nos blessés de l'hôpital de Blidah, en 1840, le capitaine U***, aujourd'hui colonel, se remémorant les soins que nous avions pris de son intéressante position, il y a 8 ans, vint nous rendre visite. Le souvenir de sa cruelle blessure, les détails exacts et importants obtenus de lui, ont ramené notre attention sur un sujet d'étude que d'autres occupations nous avaient fait ajourner. Notre travail, pour venir un peu tard quant à la date du fait lui-même, intéressera peut-être encore, nous y tâcherons du moins, par les résultats ultérieurs de la blessure et les points de discussion qu'ils soulèvent.

Un mot d'abord sur les plaies de l'orbite en général.

1° Quand une balle vient frapper directement le globe

oculaire, elle le déchire, disperse ses enveloppes et se loge dans la cavité, au lieu et place des humeurs. Elle ne va pas plus loin, si elle est sur la fin de sa course.

Un exemple bien net de ce genre de lésion s'est offert à nous au mois d'avril 1840. *Lasnier*, infirmier d'ambulance, de service aux tirailleurs, reçut, le 25, une balle morte qui pénétra dans l'orbite gauche par la fente palpébrale, et broya le globe oculaire, sans porter atteinte aux parois de la fosse. L'accident fut immédiatement suivi d'un œdème inflammatoire avec suffusion sanguine de la région, tel, qu'on ne put, à l'ambulance, écarter les paupières et s'assurer de la nature des désordres. On dirigea le blessé sur l'hôpital de Blidah, le 27 au soir. Une énorme tumeur violacée, d'où s'échappait un suintement sanieux, occupait la circonférence de l'orbite. Il y avait de la fièvre et de la céphalalgie ; nous pratiquâmes une saignée du bras, et, à défaut de sangsues, nous couvrîmes l'œil affecté de compresses d'eau froide. Le 29, le gonflement avait notablement cédé. Les paupières ne s'écartaient encore que très-douloureusement, et, dans une très-petite étendue, assez toutefois pour laisser entrevoir un corps noirâtre, qu'à sa dureté au travers de la peau on reconnaissait être une balle. Le malade se refusa à l'extraction. L'orbite se vida par suppuration, et L..., en attendant qu'on liquidât une pension demandée pour lui, put reprendre son service à l'hôpital de Douera. Nous l'y revîmes plusieurs fois, dans la suite, à notre passage : à part quelques pesanteurs de tête, il ne souffrait pas du tout de la présence du corps étranger, et il disait plaisamment : « qu'il ne le ferait « enlever qu'après l'obtention de sa pension, attendu que le « garder valait tous les certificats possibles. »

2° Si une balle atteint obliquement le globe oculaire, la surface sphérique et élastique qu'il lui oppose peut la faire dévier ; ou bien encore, il arrive que l'œil, sans se rompre, se laisse entraîner en dehors de sa cavité, et pend ensuite sur la joue, la pommette ou la tempe. Covillard, rapporte Dupuytren, prétend avoir réussi quelquefois à replacer l'organe, *et à conserver ainsi la vue aux malades*, ce qui paraît au

moins extraordinaire. Réfléchi sur le globe oculaire, le projectile, dans d'autres circonstances, conserve assez de force pour fracturer les parois osseuses de l'orbite et se loger dans les cavités voisines. M. Serrier (Mémoire sur la nature, les complications et le traitement des plaies d'armes à feu) rapporte le cas fort curieux d'un soldat du camp de Bouffarck, tué par une balle qui avait frappé le globe oculaire droit, s'était glissée entre lui et la paupière supérieure, pour perforer l'orbite, entrer dans le crâne et désorganiser totalement le lobe antérieur de l'hémisphère cérébral droit.

La résistance des parties osseuses qui constituent le limbe antérieur de l'orbite, la dureté et la convexité de l'arcade sourcilière, la saillie des apophyses orbitaires, de l'externe surtout, expliquent suffisamment la réflexion des balles et les fractures comminutives qu'elles produisent, quand elles portent sur ces parties : si c'est là bien certainement la règle, nous avons noté cependant une exception terrible, au mois de novembre 1840. L'armée de ravitaillement de Médéah traversait rapidement le passage dangereux du Ténia des Mouzaïas dans l'Atlas, lorsqu'on amena à l'ambulance un soldat du deuxième bataillon d'infanterie légère d'Afrique, dont les orbites, entièrement fracturées, ne contenaient plus, de chaque côté, qu'un court et informe tronçon de globe oculaire. Le coup de feu, tiré presque à bout portant, et, sans doute, au moment où ce malheureux tournait la tête, avait pénétré transversalement l'orbite gauche, enlevé le globe et la paupière, coupé, en emporte-pièce, la racine osseuse du nez, labouré de même l'œil droit, et était sorti en broyant l'apophyse orbitaire externe du côté opposé.

Mais revenons aux cas ordinaires. Les fractures comminutives de l'orbite, très-graves déjà par elles-mêmes, se compliquent encore par la pénétration des projectiles ou de leurs fragments dans le crâne, dans les sinus frontaux et maxillaires, dans les fosses nasales. En général, l'extraction de ces corps étrangers est entourée de grandes difficultés, et si leur séjour n'amène pas toujours de graves complications ou de la gêne, souvent des infirmités, on ne peut disconvenir que

c'est un prétexte de ne les y abandonner qu'en désespoir de cause. Ravaton a cité plusieurs exemples de séjour de balles dans le sinus maxillaire, où elles n'ont déterminé aucun accident. M. Baudens (Clinique des plaies d'armes à feu) parle d'un blessé qui eut l'arcade sourcilière droite fracturée ; la balle s'engagea dans la lame interne du sinus frontal, et put être extraite : il n'en fut pas de même chez un officier espagnol dont M. Serrier a donné l'histoire ; la balle était mobile dans le sinus frontal droit, où le blessé la sentait remuer quand il faisait de grands mouvements ; on lui proposa le trépan, mais il ne voulut pas y consentir. Lorsque les cavités qui recèlent ces corps étrangers n'ont pas d'ouvertures déclives pour l'écoulement des humeurs que l'irritation causée par le projectile y entretient, il est sûr qu'une fistule s'y établira. Cette raison seule suffirait à indiquer impérieusement l'extraction, si celle-ci était possible : et les chirurgiens sont si bien éclairés à cet égard, que l'ignorance de la présence du corps contondant est le seul motif qu'ils allèguent généralement quand ils n'ont pas fait de tentatives d'ablation. Il importe donc beaucoup d'examiner avec une minutieuse attention les blessures de la face, afin de s'assurer si le projectile ne s'y est pas logé, et d'éviter plus tard des regrets, lorsque malheureusement on peut se reprocher de n'avoir pas rempli une indication réalisable.

« Il n'est pas difficile d'extraire une balle arrêtée dans « les fosses nasales, dit Dupuytren, elle y est rarement en- « clavée. » On peut la pousser dans l'arrière-bouche, si on ne peut l'amener vers les narines antérieures ; et c'est par là qu'elle sort de préférence quand on l'abandonne à elle-même : ainsi on l'a vue crachée par des personnes qui l'avaient portée pendant longtemps. L'observation suivante donnera une idée complète des difficultés diagnostiques et opératoires qu'oppose une balle enclavée.

M. U***, capitaine au bataillon de tirailleurs de Vincennes, est atteint, dans la plaine de Mitidja, en Algérie, au mois de mai 1840, par une balle qui vient frapper l'angle externe de l'orbite gauche. Après avoir reçu les premiers soins à l'ambulance de la division, il est évacué sur l'hôpital

militaire de Blidah; l'œil est le siége d'une violente tuméfaction; l'angle orbitaire présente une petite plaie, se continuant en dedans avec la commissure externe de l'orbiculaire, qui se trouve ainsi agrandie; et, en écartant ses bords, on entrevoit le globe oculaire : il ne perçoit plus la lumière, mais il a conservé sa transparence et sa limpidité. M. U*** accuse une sensation de gêne et de pesanteur à la voûte palatine ; il lui semble que là gît un corps étranger, et aussitôt après sa blessure « il a fait, dit-il, de violents efforts « pour le cracher » ; l'inspection de la bouche et du plancher des fosses nasales ne nous fait, pas plus qu'aux chirurgiens de l'ambulance, découvrir le moindre obstacle ; d'un autre côté, l'absence de lésion grave des paupières et l'intégrité apparente de l'œil, nous laissent supposer que le projectile a été réfléchi et n'a fait que contusionner violemment l'organe.

Le traitement fut dirigé d'après ces présomptions.

Vers le huitième jour, la tuméfaction palpébrale avait beaucoup diminué ; en promenant le doigt sur le pourtour orbitaire, le blessé sentit un corps mobile en bas et en dehors ; mandé près de lui, incontinent, je reconnus effectivement un fragment de forme étroite, allongée et un peu incurvée. Dans la croyance où j'étais toujours de la non-pénétration de la balle, je m'arrêtai à cette idée que l'angle supérieur de l'os malaire avait été fracturé et détaché du reste de l'os, de telle manière qu'il pouvait bien flotter sous la peau. Pour l'extraire plus facilement, je fis une petite incision au niveau de son extrémité interne et au-dessous de la paupière inférieure. Ma pince accrocha un quart ou un cinquième, environ, de balle, aplati, étiré, tout à fait comme l'apophyse osseuse que j'avais pensé sentir en l'explorant.

Evidemment ce n'était pas là tout le projectile ? Etait-ce bien tout ce qui restait ? Rien ne nous mettait sur la voie, qui pût nous en assurer; le globe de l'œil, de plus en plus rouge et troublé, était toujours entier et en place; nous évacuâmes bientôt M. U***, persuadé qu'il ne conservait plus rien du corps étranger qui l'avait atteint. Nous expri-

mêmes confidentiellement nos craintes de lui voir perdre l'œil à son frère qui l'accompagnait.

Le globe se vida, en effet, vers le vingtième jour après l'accident. L'impression d'un obstacle dans les narines continuait à se faire sentir ; M. U*** croyait même qu'il y remuait. Rentré en France et se livrant à l'exercice du cheval, il remarqua que le corps étranger obéissait aux secousses de l'équitation. Il en parla aux médecins qui le soignaient, et la tuméfaction ayant cédé de manière à permettre une exploration plus parfaite, on acquit la certitude que le projectile, après s'être divisé sur l'apophyse orbitaire et avoir abandonné une partie de sa masse dans l'orbite, avait continué son trajet derrière le globe oculaire, et perforé l'os planum pour s'arrêter, en se déformant, dans les cornets ethmoïdaux de la fosse nasale gauche.

M. U***, qui n'éprouvait pas précisément de souffrances, retourna en Afrique, comme chef de bataillon, en 1841. Les douleurs locales s'exaspérèrent tout à coup ; la fièvre s'alluma sans discontinuer : il fallut revenir en France. A Paris, le commandant U*** s'adressa au docteur Pasquier fils, qui lui avait donné les premiers soins sur le champ de bataille. Notre honorable chef, en présence de MM. Marjolin et Blandin, dirigea, selon les indications du patient, une sonde métallique jusque sur la balle, qui fit entendre sous la percussion un son caractéristique, tandis que le blessé la sentait se déplacer. L'extraction, tentée sur-le-champ, échoua faute de pinces dont les mors fussent assez déliés pour s'engager profondément. On ne réussit pas mieux, dans une seconde séance, avec de nouvelles pinces, un tire-fond, un levier, etc. ; l'instrument introduit ne trouvait pas prise : la balle n'opposait sans doute à son jeu qu'une portion minime de son volume, et ne pouvait être perforée par son centre de figure. On imagina de chercher, par un effort considérable de pression, à briser les lamelles osseuses qui enclavaient la balle, pour pouvoir ensuite l'embrasser plus complétement avec de petites pinces à mors concaves. M. Blandin voulut pénétrer dans les fosses nasales postérieures, à l'aide de l'index passé par la bouche.

Cette manœuvre ne fut pas supportée. Enfin, on porta dans le nez une tige d'acier droite et solide ; après l'avoir fixée contre la balle, on tâcha de la faire basculer vers le pharynx ; épuisé, au bout d'une heure et demie de tentatives stériles et fatigantes, M. U*** se retira, renonçant à des épreuves qu'un courage stoïque lui avait fait endurer jusqu'alors.

Pendant près d'un an, les dents supérieures du côté gauche ont été insensibles au toucher ; l'odorat était paralysé et le goût manifestement altéré. Aujourd'hui encore, l'olfaction est imparfaite, et, lorsqu'une température froide et humide règne, la pituitaire est aussi frappée d'insensibilité ; l'oreille gauche a acquis de la dureté. Pendant près de quatre ans, il y a eu, par la narine affectée, des écoulements sanguins, noirâtres et fétides ; ils n'apparaissent guère, maintenant, qu'à la suite de courses forcées, à cheval surtout, et à vives allures ; ils ne sont plus odorants. La balle remue parfois au moindre hochement de tête, et la déglutition contre la voûte palatine y détermine de la douleur ; la respiration nasale, à gauche, est difficile, et quand M. U** se couche sur le côté droit, l'air ne passe plus dans la narine opposée : « on dirait, » c'est ainsi qu'il s'exprime, « d'une soupape qui se ferme instantanément. »

Avant sa blessure, le colonel U*** avait de fréquentes migraines : elles se sont notablement amendées depuis ; mais l'irritation permanente et, quelquefois aussi, douloureuse, causée par le corps étranger, plus encore, peut-être, la préoccupation morale, ont rendu le sommeil pesant et entrecoupé de rêves bizarres : le travail de tête est insupportable, et, pour peu que les douleurs s'exaltent, il survient une véritable disposition à la mélancolie.

Nous avons exposé avec détail les apparences qui ont donné le change au diagnostic. Nous ne craignons pas de le dire : chacun ici se fût fourvoyé comme nous, comme avaient été d'abord trompés les chirurgiens de l'ambulance, et, à leur tête, l'habile praticien que nous avons nommé. Mais, en admettant même qu'un cathétérisme du plafond des cavités nasales, cathétérisme que rien n'indiquait, eût providentiellement mis sur la voie d'une balle enclavée,

qu'eût-on pu faire? Nous avons énuméré tous les moyens qu'une ingénieuse sagacité a suggérés à nos savants confrères de la capitale, et le peu de succès obtenu. Pendant tout le temps que le globe oculaire était entier, il n'y avait rien à faire dans et par l'orbite. Le seul regret à exprimer serait qu'au moment de la fonte de l'organe on n'ait pas exploré les parois internes de la cavité; alors, approchant plus facilement du projectile, et brisant avec précaution les lames papyracées de l'ethmoïde, on eût eu quelques chances d'extraction : mais on ne peut se dissimuler, toutefois, que le voisinage de nerfs importants, la proximité de l'encéphale et la crainte d'en ébranler la boîte osseuse, eussent rendu l'opérateur bien circonspect.

Le colonel U*** doit-il renoncer à être débarrassé un jour de sa balle? Nous ne le croyons pas absolument. Si l'enclavement du projectile dans des cavités étroites et compliquées semble plus définitif, on peut compter encore sur l'irritation et la modification de contact des parties qui retiennent le corps étranger; il peut changer de place et être dans de meilleures conditions pour amener ce résultat; pour toutes ces raisons, nous estimons que, sans les rendre aussi longs et aussi fatigants, il serait bon de répéter, de temps à autre, les cathétérismes et les tentatives d'extraction; le temps est quelquefois d'une grande efficacité dans ces sortes de difficultés. On rapporte, dans les *Mémoires de l'Académie de Berlin*, l'histoire d'un individu qui conserva, pendant vingt-cinq ans, une balle dans le sinus maxillaire, et la rendit spontanément par la bouche au bout de ce laps de temps.

Le *Journal médico-chirurgical d'Edimbourg* (juillet 1842), a publié une observation qui montre encore comment des corps étrangers, même volumineux, peuvent, à la suite de coups de feu, rester longtemps ignorés dans la cavité nasale. En 1828, un lieutenant dont le fusil éclata à la chasse, fut atteint, entre les deux apophyses orbitaires internes, un peu au-dessous de l'arc transverse des sourcils; on ne constata qu'une lésion du frontal; onze mois après, le blessé guéri, on s'aperçut que la voûte du palais était traversée par un corps métallique. Le malade perdit l'odorat, et une suppuration infecte s'écoula par le nez. En 1842, le corps était encore en place, c'était une portion de la culasse d'un fusil logée derrière la pyramide nasale, entre l'os ethmoïde et l'apophyse palatine du maxillaire supérieur. M. Ballingall, qui rapporte ce fait, d'après l'inspecteur général Marshall, pense qu'on n'aurait pas obtenu grand profit de l'extraction, en supposant que le blessé eût accepté l'opération. Si, cependant, comme il le dit, le corps étranger était devenu plus libre et, de jour en jour, plus saillant, on ne comprend pas trop la raison qui fait parler ainsi le praticien anglais.

à Lord Herbert
hommage respectueux
D^r Seutin

MÉMOIRE ET OBSERVATIONS

SUR

LES KYSTES DU COU;

PAR

LE DOCTEUR SEUTIN,

MEMBRE TITULAIRE DE L'ACADÉMIE ROYALE DE MÉDECINE DE BELGIQUE,
CHIRURGIEN EN CHEF DE L'HÔPITAL SAINT-PIERRE, ETC.

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BRUXELLES,
J.-B. DE MORTIER, IMPRIMEUR DE L'ACADÉMIE,
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1853

MÉMOIRE

ET

OBSERVATIONS SUR LES KYSTES DU COU.

Depuis longtemps je me proposais de présenter à l'Académie le résultat de mes observations et de mes recherches sur le traitement des tumeurs qui se développent aux parties antérieures et latérales du cou, et désignées sous les noms de *goître kysteux*, *kystes sanguins*, *kystes hématiques*, *hématocèle* du cou, etc. J'avais déjà eu l'idée d'en parler, lorsque feu De Lavacherie soumit à la Compagnie son Mémoire sur les tumeurs du cou, dont j'attendis vainement la discussion. J'ai donc résolu de présenter le résultat de mes recherches comme mémoire d'obligation ; aujourd'hui que M. Michaux a produit un travail sur le même sujet, je pense que cette question est toute d'actualité.

Les kystes du cou sont une de ces affections que le praticien rencontre très-souvent ; elles constituent une difformité dont les malades cherchent à se débarrasser par tous les moyens. Elles peuvent, du reste, prendre un accroissement assez considérable pour gêner des fonctions importantes : la respiration, la phonation et la déglutition. Il est donc très-important de savoir quand et comment on peut les opérer. C'est ce que je vais tâcher d'établir.

Les kystes de la partie antérieure du cou siégent tantôt dans le parenchyme de la glande thyroïde, tantôt dans les tissus qui l'enveloppent, quelquefois même on les trouve dans les régions

sus-hyoïdienne et sus-claviculaire. Ils peuvent être multiples; en ce cas la tumeur est multilobulée. Je les diviserai en trois catégories : kystes séreux, kystes hématiques, et kystes hémorragiques.

Les premiers renferment une sérosité d'un jaune plus ou moins foncé, citrine, verdâtre, roussâtre, tantôt claire, tantôt trouble.

Les kystes hématiques renferment un liquide opaque foncé, plus ou moins épais et grumeleux, offrant la couleur et l'aspect du chocolat ou du marc de café. C'est évidemment du sang ayant subi une transformation par suite de son long séjour dans la cavité de la tumeur.

Les kystes hémorragiques renferment généralement aussi un liquide brun semblable à du chocolat ou à du marc de café, mais plus liquide, et quelquefois du sang noir ou même rouge, plus ou moins altéré. Ces kystes se distinguent des précédents par un caractère des plus importants, par un phénomène bien propre à dérouter ceux qui ne les connaissent pas : lorsqu'on les ouvre, il en sort, d'une manière continue, du sang d'abord noir, puis rouge. C'est une véritable hémorragie qui peut aller au point de rendre le malade anémique. Le sang coule en nappe ; il paraît sourdre de tous les points de la surface du kyste, et non d'un orifice artériel ou veineux qui s'y ouvrirait. Si la tumeur a été vidée par une simple ponction et que l'ouverture en ait été fermée, l'hémorragie a lieu également : le sang s'amasse alors dans le kyste et le ramène immédiatement à son volume primitif, ou même à un volume supérieur. Ce phénomène curieux rend ces kystes hémorragiques bien distincts des kystes séreux et des kystes hématiques simples.

Ces trois espèces de kystes peuvent exister soit seuls, à l'état simple, soit avec des maladies de la glande thyroïde, et surtout l'hypertrophie, le squirrhe et le cancer. On conçoit que ces complications ne sont nullement indifférentes pour le pronostic et le traitement.

Je passe maintenant à l'exposition de l'anatomie pathologique de ces tumeurs : mes observations me permettent de la donner plus complète qu'on ne l'a fait jusqu'à présent.

ANATOMIE PATHOLOGIQUE.

Les kystes séreux sont constitués par une membrane mince et tenue, blanche, transparente, lisse, analogue aux séreuses, aux

synoviales, et surtout aux bourses muqueuses accidentelles. Quelquefois cette membrane offre des inégalités, des rugosités, des espèces de végétations à sa surface interne ; alors le liquide qu'elle contient, n'est pas clair, mais grumeleux. Quelquefois, surtout quand la tumeur est ancienne, cette membrane tenue repose sur une base de tissu cellulaire condensé et induré. C'est dans ce cas qu'on la dit épaissie, indurée, cartilaginifiée. C'est dans ce cas aussi que le diagnostic est difficile, et que l'on peut surtout confondre ces kystes avec des tumeurs solides.

Les kystes hématiques offrent le même aspect, les mêmes éléments anatomiques. Seulement, plus souvent que dans les kystes séreux, la membrane est inégale, rugueuse, chagrinée, et au lieu d'être blanche, elle offre une teinte foncée, brunâtre, comme ecchymotique.

Ces membranes produisent, par exhalation, une sérosité plus ou moins modifiée. Lorsqu'on les a vidées par la ponction, cette sérosité les remplit de nouveau au bout de quelque temps.

Les kystes hémorragiques sont tout différents des précédents par leurs caractères anatomiques. Cette différence explique parfaitement la production de l'exhalation sanguine qui les caractérise.

La surface interne de ces kystes offre une coloration rouge, brune ou violacée ; elle est comme villeuse, veloutée, et non pas lisse et polie, ou rugueuse, comme celle des kystes séreux et hématiques. Elle est constituée par un tissu plus ou moins épais, mou, spongieux, contenant de nombreux vaisseaux entrelacés. Les injections poussées dans les artères et dans les veines ne passent pas dans la cavité. Il n'y a donc pas ouverture de la lumière d'un vaisseau dans celle-ci ; il n'y a pas davantage perforation latérale du vaisseau. Ces recherches anatomiques démontrent que l'hémorragie est due à une exhalation qui a lieu par toute la surface du kyste, par une transsudation de sang à travers les parois des nombreux vaisseaux que j'ai signalés. Cette conséquence de mes recherches anatomo-pathologiques est tout à fait d'accord avec ce fait observé pendant la vie, que le sang ne part pas d'un point quelconque de la tumeur, mais de tous à la fois, et que l'hémorragie a lieu en nappe. C'est ce qu'ont pu constater tous les chirurgiens auxquels il est arrivé d'ouvrir de ces sortes de tumeurs.

La membrane interne des kystes hémorragiques n'est donc pas une séreuse comme celle des kystes séreux et hématiques ;

c'est une membrane vasculaire. Cette membrane peut être plus ou moins épaisse ; mais elle l'est toujours plus que celle des kystes décrits précédemment. Je ne puis mieux comparer le tissu qui la compose, qu'à un tissu érectile ; comme lui, il est spongieux, formé de nombreux vaisseaux entralacés. C'est en quelque sorte un tissu érectile étalé en membrane autour d'une cavité centrale dans laquelle s'amasse le produit de la transsudation qui nécessairement est du sang.

Les kystes hémorragiques ne sont pas sans rapports avec les kystes hématiques simples. Dans les uns et les autres, le liquide offre le même aspect, généralement couleur chocolat ou de marc de café. Dans les uns et les autres, c'est également du sang altéré. Cependant les kystes hématiques ne sécrètent plus de sang, puisque, une fois évacués, ils ne produisent plus qu'une sérosité limpide, ou trouble ou sanguinolente. Mais, à un moment donné, ils ont dû fournir du sang, puisque leur cavité renferme ce liquide modifié. Cela a pu arriver de trois manières différentes que je vais successivement exposer :

1° Une contusion a déterminé un épanchement de sang au sein des tissus ; ceux-ci se sont condensés sous forme de membrane autour de l'épanchement, et il en est résulté un kyste renfermant du sang plus ou moins modifié.

2° Une forte contusion a porté sur les parois d'un kyste séreux et les a déchirés de façon à ouvrir des vaisseaux sanguins dans sa cavité. Une hémorragie en est résultée, et elle a continué jusqu'à ce que la réplétion complète de la cavité, comprimant les vaisseaux qui s'y ouvraient, l'a arrêtée.

3° Il a pu se faire qu'à une certaine époque, la structure des parois de ces kystes a été telle qu'elle a fourni une transsudation sanguine, qu'elle a été identique avec celle des kystes hémorragiques. Elles étaient constituées par une membrane vasculaire. Mais depuis elles se sont amincies, leurs vaisseaux se sont oblitérés, ou ont diminué de volume, et elles se sont rapprochées de la nature des membranes séreuses. Comment cette transformation, que la nature de la lésion et que l'anatomie nous indiquent, s'est-elle opérée? Sans doute par la compression exercée sur la membrane vasculaire, par l'augmentation de volume de la tumeur à laquelle est venue se joindre la diminution de l'afflux du sang qui constitue le travail pathologique.

Lorsque de ces trois modes de production, le premier a lieu, il peut arriver que consécutivement de la sérosité soit sécrétée et se mêle au sang primitivement épanché. Dans le second, ce mélange peut et doit avoir lieu très-fréquemment. Enfin, dans le troisième, une fois la transformation opérée, la membrane peut laisser exhaler de la sérosité. D'une façon comme de l'autre, il en résulte des kystes séro-sanguinolents qui établissent d'une manière insensible le passage des kystes séreux aux kystes hématiques.

L'anatomie pathologique des kystes hémorragiques n'ayant pas encore été faite, je donne ici deux observations dans lesquelles l'autopsie a eu lieu, et qui m'ont en quelque sorte permis de prendre la nature sur le fait.

1re OBSERVATION. — *Kyste hémorragique ; scarlatine ; mort.*

Dieudonnée Libotte, âgée de trente-cinq ans, née à Huy, épouse de Jacques Bauvenetty, entra à l'hôpital Saint-Pierre le 1er décembre 1841.

Elle était atteinte d'une tumeur à la partie antérieure et moyenne du cou, proéminant davantage vers le côté droit. Cette tumeur offrait à peu près le volume de deux poings ; elle était dure, rénitente, sans inégalités ni bossesures ; des veines volumineuses rampaient à sa surface. Une ponction exploratrice en fit sortir un liquide brun, sanguinolent, semblable à une décoction de café.

Je pratiquai une ponction au moyen d'un gros trocart ; la tumeur se vida ; j'y poussai des injections de tisane tiède, pour bien évacuer tout le liquide ; je plaçai une sonde en gomme élastique dans la canule, puis je retirai celle-ci. La sonde laissée à demeure, fut bouchée hermétiquement.

Immédiatement après la ponction, la tumeur reprit son volume primitif ; le lendemain, elle était devenue encore plus grosse. Je débouchai la sonde ; il est sortit du sang moins noir que le sang veineux, et des caillots. Je dilacérai ceux-ci en promenant la sonde dans la cavité ; puis j'y fis une nouvelle injection composée de tisane et d'eau-de-vie camphrée.

Le troisième jour, il y avait une inflammation assez forte ; il sortit par la sonde de la sérosité sanguinolente, mêlée de petits caillots. Injections émollientes ; je laisse toujours la sonde à demeure pour entretenir et accroître l'inflammation.

Le quatrième jour, la peau se couvrit de petites taches rouges, sous forme de miliaire, et le lendemain la malade offrit tous les symptômes de la scarlatine. Elle déclara qu'au moment de son départ de chez elle, ses enfants étaient convalescents de la même maladie, et qu'elle n'en avait jamais été atteinte. Cependant

l'inflammation du kyste était arrivée à un assez haut degré et la suppuration avait commencé à s'établir.

Le sixième et le septième jour, l'éruption parcourut ses périodes ; la suppuration devint fétide et diminua considérablement. On se borna aux injections émollientes, et on laissa la sonde à demeure dans le sac.

Le huitième jour, des phénomènes cérébraux se déclarèrent tout à coup sans cause connue ; l'éruption disparut ; on pratiqua des saignées générales et locales ; on couvrit les extrémités de sinapismes pour rappeler l'éruption. Tout fut inutile, et le 9 décembre, la malade succomba.

Autopsie. — Méninges gorgées de sang et de sérosité ; ventricules cérébraux renfermant également de la sérosité.

La tumeur était accolée à la partie antérieure droite de la trachée artère et paraissait avoir son point de départ à la partie interne du lobe droit du corps thyroïde. C'était un véritable kyste, formé d'une cavité centrale et de parois membraniformes. Elle fut coupée en deux par un plan médian, pour en examiner la structure. Elle offrait à la coupe une certaine ressemblance avec une orange vidée de son contenu. Ses parois internes étaient formées par une membrane épaisse, mollasse, veloutée, brunâtre, moins foncée à sa surface, qui présentait des points et des lignes jaunâtres et blanchâtres. Cette membrane semblait composée d'une foule de petits vaisseaux serrés les uns contre les autres. Une injection poussée par la carotide et une autre poussée par la veine jugulaire interne, ne se firent pas jour dans la tumeur. L'hémorragie n'était donc pas due à un vaisseau qui se serait ouvert dans la cavité ; elle était le résultat de l'exhalation de cette couche vasculaire que j'ai signalée.

La figure 1re représente la tumeur vue de face ; la figure 2 montre l'aspect de sa paroi interne après qu'elle eut été ouverte ; les plis proviennent de son affaissement ; on y aperçoit les taches et les stries blanchâtres et jaunâtres dont j'ai parlé.

Voici une autre observation, dans laquelle j'ai pu constater la structure d'une semblable tumeur avant l'emploi d'aucun traitement modificateur.

IIe OBSERVATION. — *Kyste hémorragique. — Abcès rétro-sternal. — Mort.*

Cathérine Vanderhoeven, âgée de vingt-huit ans, née à Aerschot, demeurant à Saint-Josse-ten-Noode, portait depuis plu-

sieurs années un goitre offrant à peu près le volume de la tête d'un fœtus au sixième ou septième mois de la grossesse. Ce goitre avait débuté par une tumeur peu volumineuse. Il était situé à la partie antérieure gauche du cou, qui s'était constamment accrue. Le 1er mai 1842, elle fit appeler M. le docteur J.-R. Bosch, de Saint-Josse-ten-Noode. Celui-ci la trouva atteinte d'aphonie ; la tumeur était devenue douloureuse à sa partie inférieure, et avait augmenté de volume, tout d'un coup, d'une manière considérable. La face était rouge et vultueuse, la peau chaude et brûlante ; il y avait de la céphalalgie et une fièvre intense. M. le docteur Bosch institua un traitement antiphlogistique énergique : saignées générales, sangsues au-dessous de la tumeur, à l'endroit douloureux, repos, diète, etc. Ce traitement fut continué jusqu'au 16 mai ; cependant, l'état de la malade au lieu de s'améliorer, allait en s'aggravant. M. Bosch crut s'apercevoir que le goitre, jusqu'alors dur et rénitent, offrait une certaine fluctuation. Il appela en consultation M. le docteur Vanhuevel, qui jugeant ce cas très-grave, proposa de m'appeler en consultation. Je vis cette malade le 19 mai ; elle était très-oppressée ; il y avait suffocation imminente. Nous décidâmes, dans l'espoir de la soulager, de pratiquer dans le goitre une ponction évacuatrice au moyen du trocart. Il s'écoula une énorme quantité de liquide brun noirâtre, semblable à du sang veineux. La ressemblance était telle, qu'au premier abord M. le docteur Vanhuevel émit l'opinion que le trocart avait percé la veine jugulaire externe qui passait au devant de la tumeur et qui était volumineuse, mais nous nous assurâmes qu'il n'en était rien : en la comprimant au-dessus et au-dessous de l'endroit de la ponction, on ne modifiait en rien l'écoulement. Celui-ci cessa spontanément au bout d'un certain temps ; alors je fermai la petite plaie au moyen de plusieurs emplâtres agglutinatifs superposés. Le lendemain 20 mai, la tumeur était revenue à son volume primitif ; j'enlevai l'emplâtre, et il s'écoula de nouveau une grande quantité de liquide semblable à du sang artériel mêlé de la sérosité. Cependant l'état de la malade n'avait fait que s'aggraver, malgré l'évacuation déterminée par la ponction ; et le 20 mai vers trois heures de l'après-midi, elle succomba dans un état d'asphyxie.

Nécropsie de la tumeur. — Les parents refusèrent de laisser faire l'autopsie ; cependant M. Bosch put enlever le larynx et la trachée avec la tumeur située au devant d'eux. En coupant ces parties au-dessus de la fourchette du sternum, il vit

s'échapper une énorme quantité de pus crémeux ; ce pus provenait d'un foyer situé dans le médiastin antérieur. Cet abcès était remonté au-dessus de la fourchette, en propulsant la tumeur du cou en haut et en avant. C'était lui qui comprimait la trachée et les bronches et déterminait la suffocation ; et voilà pourquoi la ponction du goitre n'y avait apporté aucun soulagement. C'était ce phlegmon rétro-sternal, dont la formation avait provoqué la fièvre, qui causait les douleurs que la malade ressentait à la partie inférieure du cou.

M. Bosch apporta la pièce détachée, comme je l'ai dit, à l'hôpital Saint-Pierre. Là je procédai à son examen, en présence de ce confrère et de plusieurs élèves.

Cette tumeur me rappela immédiatement la précédente. Elle était accolée au larynx et formée aux dépens du lobe gauche du corps thyroïde, qui avait totalement disparu. Elle était constituée par un kyste à parois molles et épaisses ; une coupe transversale lui donna l'aspect d'une grenade coupée en travers et vidée. La membrane interne, au lieu de ressembler à une séreuse comme dans les kystes séreux, était mollasse, veloutée, d'un brun rougeâtre ; elle était aussi constituée par un tissu très-vasculaire, à tel point qu'on l'aurait dite composée de vaisseaux entrelacés ; en la pressant fortement entre les doigts, on faisait sourdre du sang. Aucune veine, aucune artère ne communiquait avec le sac ; on constata de nouveau que la veine jugulaire externe avait été respectée par le trocart, de sorte que le sang n'avait pu provenir que de la tumeur. C'était donc, comme dans le cas précédent, un kyste formé par une membrane vasculaire, analogue au tissu érectile ; le sang provenait de cette membrane, par exhalation.

La figure 3, montre la tumeur accolée au côté gauche de la trachée-artère et coupée transversalement ; on voit la teinte rougeâtre violacée de la membrane interne.

La seule différence entre ce cas et le précédent, c'est qu'ici cette membrane était plus épaisse, plus vasculaire, et qu'elle offrait une teinte foncée uniforme, sans stries ni taches jaunâtres ou blanchâtres. Or, dans l'observation première, un traitement dont l'expérience m'avait démontré l'efficacité avait été institué ; tandis qu'ici la tumeur était vierge de tout traitement curatif. C'est à cette circonstance que je crois devoir attribuer ces différences.

D'après cela, l'effet du traitement consisterait à diminuer la

vascularité et partant l'épaisseur de la membrane interne du kyste, en rétrécissant ses vaisseaux, à la rendre plus dense et à lui faire perdre sa coloration foncée. Ces données, fournies par la comparaison de ces deux cas, sont tout à fait d'accord avec le raisonnement.

De ces deux observations il résulte, comme je l'ai dit, que les kystes hémorragiques du cou ne sont en communication ni avec les artères, ni avec les veines ; mais qu'ils sont formés par une membrane veloutée, vasculaire, gorgée de sang, véritable tissu érectile qui produit leur contenu par exhalation.

Ces recherches anatomiques montrent combien les kystes hémorragiques sont différents des kystes séreux et hématiques. Elles expliquent la présence du sang dans leur cavité et la production des hémorragies consécutives parfois si rebelles.

Il me reste à examiner dans quels tissus et de quelle manière se forment les kystes que je viens de décrire.

On les rencontre soit dans le corps thyroïde, soit dans le tissu cellulaire du cou. Lorsqu'ils se développent dans le corps thyroïde, ils peuvent être dus au développement d'une de ses aréoles qui a grossi et atrophié ses voisines. Cette idée a déjà été émise par M. Lébert. Ils peuvent être séreux, hématiques ou hémorragiques. Mais ils peuvent aussi se former par un autre mécanisme qui me semble au moins aussi fréquent. Souvent leur apparition est attribuée par les patients à un coup, un effort, ou un cri ; souvent ils ont même ressenti une douleur au cou. Qu'est-ce qu'il s'est donc passé là? Les tissus ont été déchirés, et du sang s'est épanché en écartant leurs mailles ; une légère inflammation survenue ensuite a condensé celles-ci et les a transformées en une paroi membraneuse. Voilà le kyste formé. Si son contenu reste ce qu'il était, il est hématique ; si la matière colorante est résorbée, il est séreux. Enfin, si l'appel du sang continuant vers le point irrité, les vaisseaux se dilatent dans la membrane d'enveloppe, il est hémorragique.

Les kystes hémorragiques ne sont pas rares dans la glande thyroïde comme le fait déjà prévoir sa grande vascularité.

Les kystes qui siégent en dehors de la glande thyroïde peuvent prendre naissance directement dans le tissu cellulaire. Voici comment M. Lébert explique ce développement : « Il existe un genre de tumeurs enkystées très-variables dans leur forme, qui ont pour principale cause le développement du tissu cellulaire qui, se condensant sous forme de kyste d'enveloppe, ren-

ferme un liquide plus ou moins séreux, quelquefois gluant et d'une consistance assez épaisse. Ces kystes sont surtout fréquents près des membranes séreuses, *et près des parties glandulaires*.

« En analysant avec soin les faits que nous avons eu l'occasion d'observer, nous avons pu suivre tous les passages entre une vésicule séreuse presque miliaire, et des kystes énormes multiloculaires, à parois épaisses, charnues, ou d'apparence osseuse; passages importants à signaler, parce qu'en montrant les liens physiologiques qui les unissent entre eux, on se rend aisément compte de leur mode de formation.

« La forme la plus simple de ces tumeurs est donc constituée par une condensation de fibres cellulaires sous forme d'un kyste qui renferme un liquide transparent. »

Ainsi une cause traumatique amènera dans le tissu cellulaire du cou un épanchement de sang, et un kyste pourra s'organiser autour. Ou bien une cause d'irritation y déterminera l'exsudation d'une liquide séreux; le tissu environnant se condensera sous l'influence de cette cause, et le kyste sera également formé.

Enfin les kystes du cou peuvent aussi se développer dans les ganglions lymphatiques. Il est arrivé à beaucoup de chirurgiens d'extirper des ganglions dégénérés, et de trouver au centre de l'un d'eux, un kyste renfermant un liquide blanchâtre ou séreux, ou roussâtre ou purulent. M. Malgaigne a reconnu ce développement, comme le prouvent les lignes suivantes de son *Anatomie chirurgicale*.

« Les ganglions atteints d'inflammation chronique arrivent souvent à un volume énorme, qui s'augmente encore du gonflement des tissus voisins. Pour peu que l'induration ait une date ancienne, elle résiste extrêmement à tous les moyens résolutifs et acquiert une dureté comparable à celle d'une tumeur cartilagineuse. Cela tient tantôt à l'état de la substance du ganglion lui-même, *plus souvent à la tension de la capsule ; il semble que celle-ci forme un kyste* qui isole les parties contenues de la vie extérieure et les soustrait à l'action des médicaments. Je n'ai trouvé d'autre ressource alors que d'écraser la tumeur, c'est-à-dire de faire sortir la substance ganglionnaire altérée à travers une rupture de la capsule. S'il y a une ouverture aux téguments, le ganglion est rejeté au dehors, sinon il s'éparpille dans le tissu cellulaire, ou l'absorption s'en empare assez promptement. »

Ainsi, voilà des ganglions dans lesquels non-seulement il s'est

développé des kystes, mais qui se sont transformés en kystes. M. Malgaigne n'indique pas explicitement la nature de leur contenu, mais le fait de l'écrasement de la tumeur et la rapidité de la résorption, prouvent qu'il ne peut s'agir que d'un liquide, d'une sérosité plus ou moins modifiée. Le mécanisme de cette lésion est le même que celui de la formation des kystes aux dépens du tissu cellulaire. Par une cause quelconque, un épanchement sanguin ou séreux se produit au sein du ganglion et se dissout. La distension augmente de plus en plus, et la substance propre du ganglion s'amincit et finit par disparaître. Le ganglion est alors transformé en kyste à parois plus ou moins épaisses. C'est de même qu'on voit la substance du rein être atrophiée par le développement d'un kyste qui y a pris naissance. C'est de même encore que les coques des ganglions lymphatiques se transforment en kystes tuberculeux ou en abcès froids, et acquièrent parfois un volume énorme.

Il résulte de ces considérations que les kystes séreux, hématiques et hémorragiques peuvent se former soit dans le corps thyroïde, soit dans le tissu cellulaire du cou, soit dans les ganglions lymphatiques si nombreux dans cette région.

THÉRAPEUTIQUE DES KYSTES SÉREUX ET HÉMATIQUES.

Les kystes séreux guérissent ordinairement avec facilité, par des moyens très-simples. Voici la méthode que j'emploie depuis bien longtemps. J'y fais d'abord une ponction évacuatrice; j'y injecte ensuite de la teinture d'iode mêlée à une ou deux parties d'eau; ou bien je remplace la canule du trocart par un bout de sonde en gomme-élastique taillé en biseau à son extrémité et fixée autour du cou par un cordon. Ces moyens ont pour but et pour effet de développer une inflammation adhésive. Lorsqu'ils sont insuffisants, je renouvelle les injections. Lorsque par ces moyens, je suis parvenu à provoquer une inflammation convenable, je cherche à rapprocher les parois du sac par une légère compression. Ce traitement, que j'ai employé de tout temps, m'a été suggéré par celui que le baron Larrey employait pour l'hydrocèle, maladie à laquelle j'ai toujours comparé les kystes séreux du cou. Aussi avant que M. Velpeau n'eût recommandé la teinture d'iode, je me servais soit d'eau mêlée d'alcool, soit de vin chaud, etc.

Lorsque les parois de ces kystes sont dures et épaisses, la membrane interne reposant sur un tissu cellulaire condensé,

elles ne permettent pas le rapprochement et l'oblitération de la cavité. Alors il faut inciser la tumeur dans une étendue suffisante pour y introduire des bourdonnets ou des mèches de charpie chargés d'oxyde rouge de mercure ou d'un autre caustique quelconque, afin d'exciter et de faire bourgeonner la membrane du kyste.

S'il y a plusieurs kystes, si la tumeur est multilobulée, il faudra autant d'opérations qu'il y a de kystes. Quelquefois on pourra passer de l'un à l'autre directement, en mettant en communication les deux cavités; alors il ne sera pas nécessaire de faire deux piqûres ou deux incisions à la peau.

A la suite de ce traitement, les kystes sont remplacés par des tumeurs dures, peu volumineuses, fibreuses; c'est du tissu inodulaire provenant de la membrane du kyste épaissie, et des tissus de nouvelle formation qui réunissent entre elles ses parois. Les petites tumeurs diminuent peu à peu par résorption, elles tendent à se réduire à un fort petit volume. Mais certaines d'entre elles résistent quelquefois très-longtemps, et ne se résorbent qu'au bout de dix-huit mois à deux ans, comme je le prouverai plus bas. On conçoit qu'on ne devra que rarement les enlever, car elles constituent non une maladie, mais la terminaison heureuse d'une opération. Si même elles tendaient à rester stationnaires, on ne serait pas encore autorisé à les extirper. En effet, elles ne peuvent jamais menacer aucune fonction importante, ni la phonation, ni la respiration, ni la déglutition, ni la circulation. Elles ne constituent qu'une difformité peu gênante qui ne peut être à charge qu'à la coquetterie. Une telle opération serait donc une opération de complaisance, et c'est au cou moins qu'ailleurs qu'on pourrait la tolérer. Généralement ces tumeurs ont contracté d'intimes adhérences avec la trachée artère, l'artère carotide, la veine jugulaire interne; elles renferment des veines dont la section peut donner lieu à l'introduction de l'air; les vaisseaux si nombreux de cette région fournissent très-fréquemment des hémorragies consécutives. Enfin, ces opérations durent toujours très-longtemps, une heure, une heure et demie; elles fatiguent et épuisent le malade; elles amènent au contact de l'air une large surface, et provoquent la suppuration; le pus peut fuser dans la poitrine, ou bien l'infection purulente peut survenir. Cette dernière est très-fréquente dans les plaies du cou, ce qu'explique le grand nombre de vaisseaux, de ganglions lymphatiques et de veines qu'on rencontre dans cette région. Du reste, tous les

chirurgiens qui ont fait de ces opérations, Dupuytren, Boyer, M. Roux, s'en sont repentis. De Lavacherie a publié dans les Mémoires de l'Académie des opérations qui ne sont pas plus encourageantes. J'en ai fait également, et aujourd'hui éclairé par l'expérience, je m'en garderais bien.

Je ne puis à cet égard que me ranger aux paroles si vraies, que j'emprunte au livre de M. Alquier, sur la chirurgie conservatrice. Voici comment s'exprime ce confrère.

« Vers la même époque (en 1847) vint dans le même service (chez M. Roux) une jeune fille, fraîche et bien portante, pour réclamer contre son goitre une extirpation que d'autres chirurgiens de Paris avaient refusé de tenter. Fort de son habileté et de la vigueur de cette demoiselle, le célèbre professeur Roux se livre à l'ablation de cette tumeur pendant une heure et quart. Grand nombre d'artères sont liées, une belle dissection anatomique est faite, la vaste plaie est remplie de charpie, et l'infortunée personne s'éteint dans le collapsus quarante heures après, le 21 novembre 1847. Dans sa leçon de clinique, l'illustre opérateur se lamenta beaucoup sur sa condescendance, avec une sincérité facile à concevoir. Nous sommes persuadé qu'un tel malheur lui fera désormais abandonner de semblables manœuvres chirurgicales, mieux que celui dont M. Ruff raconte l'histoire, et où le célèbre professeur vit périr tout aussi rapidement un malheureux jeune homme qu'il soumit à la même opération le 16 mai 1836 (1). Quoique le noble et loyal aveu d'erreur que l'illustre chirurgien fit devant nous, nous ait inspiré une profonde estime pour lui, néanmoins nous ne saurions approuver les flatteries de M. Ruff, qui écrit : « si l'opération fut « malheureuse, si elle doit, à notre avis, détourner d'en entre« prendre de semblables, la façon sûre et hardie dont elle fut « exécutée, est tout en l'honneur de l'opérateur. » Non, mon cher confrère, une semblable dextérité n'a rien qui doive mériter l'approbation ni les éloges de la médecine opérante. C'est là au contraire un signe d'une fâcheuse manière de considérer la chirurgie, que de trouver plausible un talent qui, méconnaissant l'esprit de l'art de guérir, trouve louable la dextérité exercée au détriment des malheureux.

« C'est d'après ce fâcheux esprit trop commun que les hauts chirurgiens, animés d'une rivalité déplorable, cherchent à s'imiter

(1) *Archiv. génér. de méd.*, 2e série, tome X, p. 25.

ou à se surpasser mutuellement en entreprises nouvelles et téméraires. Le col de la matrice ou l'utérus entier est enlevé par un praticien amoureux de bruit plus que de la vie de ses malades; aussitôt, vingt, trente chirurgiens sont impatients d'égaler un émule, un rival. C'est en partie pour acquérir cette vaine réputation d'habileté manuelle que l'ovaire cancéreux et enkysté a été enlevé, les ischions et les pubis coupés, l'aorte liée. C'est pour ne pas rester en arrière, ou pour s'élever au rang de ce que le préjugé nomme grands chirurgiens, que Graefe, Hedenus, Klein, Desault, Dupuytren, Moulinier, de Bordeaux, G. Bell, etc., ont extirpé la glande thyroïde hypertrophiée, au détriment de la plupart des sujets. Comment approuver ensuite le docteur Hedenus fils, de Dresde, d'avoir dit, à propos d'une opération faite par Graefe : « Je n'ai d'autre intention que de recueillir un fait qui « peut servir à résoudre une question tant controversée, et à prou- « ver que la glande thyroïde peut être extirpée sans aucun dan- « ger ! » Aussi, dominé par le préjugé vulgaire, il s'écrie : « De « quelle admiration, de quelles louanges ne sont pas dignes le « courage et la dextérité du chirurgien qui ose extirper la glande « thyroïde engorgée ! ! ! » J'ai vu aussi une pareille ablation réussir à Lyon, et ce fait mérite d'être relaté. Une femme, âgée de trente-trois ans, d'une constitution chétive, porte depuis sa naissance une tumeur au-devant de la trachée artère et dans la position de la glande thyroïde. Fatiguée de se voir repoussée de diverses maisons où elle servait de domestique, à cause de cette difformité, cette femme réclame l'extirpation de cette tumeur dont elle exagère à dessein les inconvénients. Du volume d'une petite pomme et de forme arrondie, la tumeur est très-mobile, indolore et comme fluctuante. Le 22 août 1840, croyant avoir à enlever un kyste, M. Bonnet met à nu la tumeur qui offre une couleur chocolat, et en embrasse le pédicule à l'aide d'une forte ligature. Alors voulant constater la composition de cette tumeur, le chirurgien l'incise et des jets nombreux de sang artériel, la texture splénique, font reconnaître l'erreur. Un second lien étreint énergiquement le pédicule laissé en place, tandis que le reste de la tumeur est enlevé. La mortification fait éliminer la portion encore fixée à la trachée, et cette femme quitte l'Hôtel-Dieu, le 1er septembre, non entièrement guérie. L'habile chirurgien major reconnut non-seulement sa méprise, mais encore avoua qu'il n'aurait pas entrepris cette opération, s'il avait su d'avance de quoi il s'agissait. »

Honneur à ce praticien distingué d'avoir, même à la suite d'un succès, avoué son erreur, et cherché à prémunir les praticiens contre de semblables méprises. Honneur à cet homme honnête et consciencieux ! Combien son exemple mériterait d'être suivi !

La méthode que j'emploie dans le traitement des kystes du cou ne mérite aucun des reproches faits par M. Alquier aux opérations inconsidérées. Elle s'adresse à des tumeurs qui tendent à augmenter de volume et à gêner des fonctions essentielles; elle est simple et facile; elle n'est jamais devenue entre mes mains la source d'aucun accident. Elle me paraît être conforme aux vrais principes de la médecine opératoire, de la chirurgie conservatrice, en ce qu'elle substitue une méthode simple, facile, efficace, inoffensive à des opérations de la plus haute gravité.

Pour en revenir aux tumeurs dont je parlais tout à l'heure, j'estime qu'il ne faut jamais les enlever. Tout ce qu'on doit faire, c'est de prescrire des pommades résolutives, iodées, qui hâtent peut-être l'absorption et qui dans tous les cas ne font aucun mal. Il faut opérer ces kystes le plus tôt possible lorsque leur volume est encore peu considérable. En effet, leur membrane constitue après l'opération une surface suppurante; et moins cette surface sera large, moins il y aura d'accidents à redouter, et moins la guérison se fera attendre. Ces conditions sont d'autant mieux remplies, que le kyste est plus petit. La difformité produite par le tissu inodulaire qui remplace le kyste sera aussi d'autant moins prononcée.

Les kystes hématiques exigent le même traitement, donnent lieu aux mêmes considérations que les kystes séreux. Je n'ai donc pas à m'en occuper plus longuement; seulement leur membrane externe étant plus épaisse, ils résistent davantage à l'action des injections et demandent plus de temps avant que la résorption ne s'opère.

Voici quelques observations puisées dans ma pratique, que je rapporte à l'appui de la méthode de traitement que je viens de décrire.

IIIe OBSERVATION. — *Kyste séreux. — Extirpation.*

Mademoiselle S..., âgée de dix-sept à dix-huit ans, me consulta en 1835, pour une tumeur située à la partie inférieure du larynx, au devant de la trachée artère, ayant la forme et le volume d'un œuf de poule. Cette tumeur était très-dure et pédiculée; aidé des avis de mes collègues et anciens internes, MM. Guiette,

Langlet et Vanhuevel, je procédai à son extraction. Une incision en travers dans la direction des plis du cou, la mit à découvert ; je l'isolai de toutes parts et j'arrivai ainsi à son pédicule, qui se fixait à la membrane crico-thyroïdienne. La malade guérit parfaitement bien.

En examinant la tumeur, je trouvai que c'était un kyste rempli de sérosité. On parlait peu à cette époque des kystes séreux du cou ; on confondait toutes ces tumeurs sous le nom de goitre. Mes collègues et moi, nous crûmes avoir affaire à une tumeur solide, et c'est dans cette opinion que nous pratiquâmes l'extirpation. Mais l'examen que nous en fîmes fut pour moi un trait de lumière ; je me dis que sans doute beaucoup de ces tumeurs étaient des kystes. Dès lors je me proposai de les traiter désormais par la méthode que je viens d'exposer et qui consiste à évacuer le liquide et à provoquer l'oblitération du sac.

IVe OBSERVATION. — *Kyste séreux.*

Mademoiselle Vanhootem, de Duffel, âgée de vingt-six ans, vint me consulter en août 1837, pour une tumeur qu'elle portait à la partie antérieure du cou. Cette tumeur, dure, bien limitée, pyriforme, du volume d'une demi-bouteille ordinaire, me rappela de suite le cas précédent ; j'y fis une ponction exploratrice qui en fit sortir une sérosité roussâtre. C'était donc un kyste séreux. Je le vidai au moyen d'un gros trocart ; j'y fis des injections avec de l'eau à laquelle j'avais ajouté de l'alcool, et je remplaçai la canule du trocart par un bout de sonde en gomme élastique. Les injections furent continuées et la sonde laissée à demeure jusqu'à ce que l'inflammation devint suffisante et que la suppuration fût bien établie.

Au bout de trois mois, la guérison était complète ; il ne restait plus de la tumeur qu'un noyau dur qui diminua petit à petit. Aujourd'hui on ne voit plus rien, mais la palpation révèle la présence de ce noyau, devenu très-peu volumineux et qui suit les mouvements du larynx.

Ve OBSERVATION.

En 1845, je vis avec M. le professeur François, M. B..., notaire, à Mons, qui portait au côté gauche du cou une tumeur énorme, limitée en haut par la mâchoire, en bas par la clavicule, en dedans par la ligne médiane, en arrière par le muscle trapèze. Cette tumeur offrait de la fluctuation. Je la ponctionnai

à sa partie inférieure et postérieure ; il s'en écoula au moins un litre de sérosité citrine. Je grattai l'intérieur du sac au moyen de la canule, afin de l'irriter ; j'y poussai une injection d'une solution caustique de Vienne ; puis je remplaçai la canule par un bout de sonde en gomme élastique que je laissai à demeure. Une inflammation violente survint dans le sac ; je lui opposai les antiphlogistiques généraux et locaux, qui amendèrent ces phénomènes. La canule resta à demeure ; elle servait à faire des injections émollientes et à laisser écouler le pus, qui était sécrété avec beaucoup d'abondance. Au bout de deux mois les parois s'étaient agglutinées ; il resta une large surface un peu plus épaisse et un peu plus dure, qui disparut complétement au bout de six mois.

VIe OBSERVATION. — *Kyste séreux.*

La nommée Coosemans, âgée de vingt-trois ans, de tempérament lymphatique, née à Louvain, entra à l'hôpital Saint-Pierre le 10 juin 1847. Il y a cinq à six ans elle s'aperçut qu'elle portait à la partie latérale gauche du cou, au-dessous de l'angle de la mâchoire, une tumeur douloureuse à la pression, mais si peu considérable qu'elle n'y attacha aucune importance. Cependant, cette tumeur augmenta graduellement de volume. Il y a dix-huit mois à deux ans, elle avait atteint celui d'une noisette ; un médecin consulté à cette époque lui prescrivit des cataplasmes, des pommades, des emplâtres et une médication interne. Il appliqua ensuite sur la tumeur un morceau de potasse caustique, qui a laissé comme trace de son passage une cicatrice.

La tumeur ne continua pas moins de s'accroître.

A son entrée à l'hôpital, la tumeur était ovoïde, oblongue, son grand diamètre était obliquement dirigé de haut en bas et d'arrière en avant ; elle s'étendait de l'apophyse mastoïde jusqu'à un pouce au-dessus de la clavicule. Elle était énorme ; elle repoussait la tête vers le côté opposé et présentait au moins le volume de deux poings. La fluctuation était évidente ; une ponction exploratrice fit sortir quelques gouttes d'un liquide jaunâtre. C'était donc un kyste séreux.

Je le ponctionnai au moyen d'un trocart assez gros ; il s'écoula environ une livre de sérosité jaunâtre, contenant en suspension de nombreux petits grumeaux blanchâtres, fibrineux. Des injections de tisane tiède nettoyèrent la tumeur ; je n'employai pas l'iode, l'épaisseur des parois me faisant craindre une trop forte

inflammation. La canule fut ensuite remplacée par un bout de sonde en gomme élastique, qui fut fixé et laissé à demeure.

Le lendemain 11 juin, il sortit quelques onces de sérosité par la sonde ; injection de tisane tiède.

Le 12, l'inflammation ne se déclarant pas, j'injecte de la teinture d'iode assez étendue.

Les jours suivants on fait des injections avec de la tisane, et on laisse la sonde à demeure.

Le 15, il y a douleur, gonflement, tension considérable, inflammation vive. Je retire la sonde ; en poussant avec la main sur le kyste, j'en fais sortir une espèce de détritus sanguin formé de débris de caillots. J'agrandis l'ouverture à l'aide des ciseaux, j'extrais tous ces débris avec le doigt, en grattant les parois du sac, et je cautérise largement celles-ci ainsi que l'ouverture au moyen de la pierre infernale. Cataplasmes émollients.

Les jours suivants l'inflammation diminue, les douleurs disparaissent, et la suppuration devient louable. Continuation des cataplasmes.

Enfin, au bout de trois à quatre mois, la cicatrisation est complète ; les parois de la tumeur se sont rapprochées et ont contracté adhérence ensemble. Il ne reste plus qu'une tumeur dure, offrant à peu près la forme de la tumeur primitive, mais beaucoup moins étendue, et placée sur le côté de la trachée-artère. Je prescris des frictions d'iodure de plomb ; la tumeur diminue petit à petit, et lors de la sortie de la malade, le 21 février 1848, elle est réduite des deux tiers relativement à ce qu'elle était lors de l'entrée de la malade.

N'omettons pas d'ajouter que cette personne était d'un tempérament lymphatique très-prononcé et d'une constitution appauvrie. Aussi, lui fis-je subir un traitement général constitué par l'iodure de fer, l'huile de foie de morue, le régime analeptique, et l'exercice en plein air.

Nous avons vu que lorsque cette jeune femme sortit de l'hôpital, le noyau dur, reliquat de son kyste, était en voie de diminution. J'avais donc lieu d'espérer qu'il continuerait à se résoudre ; de nombreuses observations m'autorisaient à le croire.

Elle insista à diverses reprises pour être débarrassée de ce restant du kyste, qui offensait sa coquetterie ; j'eus de la peine à la persuader. Je l'assurai que toutes mes opérées avaient gardé de semblables tumeurs pendant dix-huit mois à deux ans, et

qu'au bout de ce temps la résorption s'était opérée. Je l'engageai à se représenter à l'hôpital, ce qu'elle ne fit pas.

Cependant, un an après, elle crut devoir s'adresser à notre collègue, M. Michaux, qui lui enleva cette tumeur et présenta l'opérée à l'Académie.

Notre collègue dit qu'elle avait le volume d'un œuf de dinde ; c'était à peu près celui qu'elle avait lors de la sortie de cette femme de l'hôpital Saint-Pierre ; elle n'avait donc pas augmenté, et l'on pouvait espérer de la faire diminuer encore par l'emploi de révulsifs administrés tant à l'intérieur qu'à l'extérieur. Qu'était cette tumeur ? M. Michaux la qualifie en un endroit de tissu graisseux, et en un autre il dit qu'elle était dure, bosselée, et due à une adénite chronique. C'était évidemment du tissu cellulaire condensé, dans lequel, comme cela arrive souvent, existaient de nombreux globules de graisse. Cette production résultait évidemment de l'oblitération du kyste ; elle pouvait se résoudre encore, au moins en partie ; elle ne menaçait aucune fonction importante, et ne pouvait en déranger aucune. C'était donc une de ces opérations de complaisance que M. Alquier blâme, d'accord en cela avec les plus illustres chirurgiens. En effet, nous voyons que M. Michaux a dû travailler pendant au moins *une heure et demie* pour enlever cette tumeur. Il a dû isoler l'artère carotide, et il n'y est parvenu que très-péniblement ; il a eu à redouter *l'introduction de l'air dans les veines ;* il a craint un moment *la lésion du nerf pneumo-gastrique ;* il a prévu, lorsqu'il s'est agi des soins consécutifs, *que le pus pouvait fuser vers la poitrine ;* enfin, il aurait pu voir terminer toute cette série d'accidents par l'infection purulente, qui n'est malheureusement pas le moins grave, ni le moins commun. Et tout cela pour une simple opération de complaisance ; pour enlever une tumeur qui ne gênait aucune des fonctions physiologiques, et qui, à mon avis, aurait pu diminuer encore.

VII^e^ OBSERVATION. — *Kyste hématique.*

Mademoiselle la comtesse de X. me consulta, en janvier 1848, pour une tumeur placée le long du bord interne du muscle sterno-cléido-mastoïdien droit. Elle avait la forme et le volume d'un œuf de pigeon. Elle s'élevait et s'abaissait dans les mouvements de la déglutition ; elle était dure, élastique, indolente, parfaitement circonscrite, sans changement de couleur à la peau. Elle était située sur l'artère carotide, mais n'offrait pas de batte-

ments. Je crus que j'avais affaire à un commencement de tumeur enkystée. Je la comprimai avec force dans tous les sens pour en obtenir la rupture, mais mes efforts furent impuissants. Alors on me proposa une consultation avec le professeur Baud. Nous décidâmes de faire la ponction de la tumeur au moyen du trocart. Il en sortit un liquide noirâtre semblable à du marc de café, renfermant des grumeaux fibrineux. Je comprimai la tumeur pour empêcher l'hémorragie qui aurait pu survenir, et je fis une injection iodée. Je remplaçai ensuite la canule du trocart par un bout de sonde en gomme élastique taillé en biseau à son extrémité, bouché hermétiquement, et fixé au moyen d'un cordonnet noué autour du cou.

Le lendemain, la sonde étant débouchée et la tumeur comprimée, il en sortit quelques gouttes de sérosité roussâtre. Nouvelle injection iodée.

Le troisième jour il survint une inflammation modérée ; bientôt la suppuration s'établit ; au bout de vingt jours, la cavité était oblitérée et il ne restait plus de la tumeur qu'un noyau dur, compacte, sans cavité aucune. Je prescrivis des frictions avec une pommade iodée ; au bout d'un mois à six semaines, cette petite tumeur commença à diminuer insensiblement. Six mois plus tard, on ne la voyait plus du tout, et il ne restait comme trace de l'opération que la cicatrice de la ponction, absolument semblable à celle d'un bouton de petite vérole.

Avant d'écrire ces lignes, j'ai revu mademoiselle de X., et je n'ai pas été peu surpris de voir reparaître, à un pouce et demi à deux pouces au-dessus de la cicatrice, une tumeur d'un très-petit volume, que je présume être le commencement d'une tumeur enkystée. Jusqu'à présent elle est trop peu perceptible pour que la jeune personne se décide à s'en laisser débarrasser.

Cette observation comparée à plusieurs autres rapportées dans ce travail, démontre qu'il faut opérer le plus tôt possible les tumeurs enkystées du cou. De cette façon, on évite les phénomènes généraux et locaux qui se manifestent lorsqu'elles ont acquis un volume considérable, phénomènes qui peuvent s'aggraver au point d'inspirer au chirurgien de sérieuses inquiétudes.

THÉRAPEUTIQUE DES KYSTES HÉMORRAGIQUES.

Passons maintenant au traitement des kystes hémorragiques.

Ici il n'y a plus seulement l'indication de procurer l'oblitération du sac par l'adhésion de ses parois ; il y a aussi et tout d'abord, l'indication d'arrêter l'hémorragie qui pourrait devenir funeste au patient. Voici la méthode qui m'a constamment réussi pour remplir cette double indication, et que je mets en usage depuis plus de quinze ans :

Je vide la tumeur par une ponction faite au moyen d'un trocart assez gros ; cela fait, si on l'abandonnait à elle-même, elle se remplirait rapidement, par suite du suintement continuel de ses parois. Mais la ponction faite, je comprime fortement la tumeur à mesure que le liquide s'écoule, afin d'éviter qu'il ne soit remplacé immédiatement ; et de suite, avant que le sang n'ait eu le temps de la remplir de nouveau, je pousse dans sa cavité une injection de teinture d'iode pure ou peu étendue. Je ferme la canule au moyen d'un bouchon pour empêcher l'injection de sortir. En même temps j'incline le malade de façon à ce que la teinture d'iode séjourne un certain temps dans le sac et se mette bien en contact partout avec ses parois. Par ce moyen, l'hémorragie cesse, mais en général ce n'est qu'une suspension momentanée, car elle reprend plus tard. Cela fait, je remplace la canule du trocart par une canule en gomme élastique, fixée par un ruban tourné autour du cou et bouchée hermétiquement. Cette canule est destinée, d'une part, à donner issue aux liquides provenant du suintement, d'autre part, à provoquer l'inflammation. Elle atteint si bien ce dernier but, que quelquefois, comme on le verra dans les observations suivantes, sa présence a suffi à elle seule pour la déterminer.

Au bout d'un jour ou deux, un caillot s'est formé dans la cavité de la tumeur ; en même temps une inflammation plus ou moins intense tend à s'emparer des parois du kyste, de manière à mettre fin à la transsudation sanguine, et à les disposer à la suppuration.

Alors, au moyen de la canule en gomme élastique, on dilacère les caillots, on les déchire, et on expulse les débris par des injections émollientes. S'ils sont trop résistants, on introduit dans la canule un stylet, au moyen duquel on achève la dilacération, et on masse, on malaxe la tumeur au point d'en faire sortir forcément des caillots vermiformes par l'orifice de la canule : cette opération a quelquefois rappelé l'hémorragie, et nécessité de nouveau des injections plus ou moins caustiques ou irritantes, avec des solutions faites avec le caustique de Vienne, le nitrate d'argent, ou la teinture d'iode. Si l'hémorragie continue, et que la tendance à l'inflammation soit peu prononcée, on pratique une

nouvelle injection avec de la teinture d'iode moins étendue, même pure au besoin, ou avec une solution de nitrate d'argent ou de caustique de Vienne. Lorsque l'inflammation est bien établie, on retire la canule, ce qu'il ne faut jamais faire avant qu'il n'y ait une adhérence bien prononcée entre la peau et les parois du kyste, adhérence qui n'arrive jamais avant le huitième ou le dixième jour. Dès lors l'hémorragie ne se reproduit plus, les vaisseaux étant oblitérés ou rétrécis par l'inflammation, et les parois du kyste étant tapissées de *lymphe plastique sanguine*.

Il peut arriver que l'inflammation provoquée par la teinture d'iode et par le séjour de la canule laissée à demeure, devienne trop violente, s'étende aux tissus voisins, provoque de vives douleurs et de la fièvre. Alors l'on est certainement à l'abri de l'hémorragie ; mais l'on doit redouter d'autres accidents, et l'indication consiste à combattre cette inflammation qui a dépassé le degré voulu. On incise, s'il le faut, le sac au moyen du bistouri conduit sur la sonde cannelée, on en retire les caillots et on le nettoie en y faisant des injections d'eau tiède. Si c'est nécessaire, on fait une saignée générale, on applique des sangsues et des cataplasmes émollients sur la tumeur, et on donne le tartre stibié à l'intérieur, etc.

L'inflammation étant ainsi déterminée, si elle est suffisante ou trop forte, on pousse tous les jours dans le sac des injections d'eau tiède, pour le nettoyer. Si elle n'est pas assez intense, on ajoute à l'eau de la teinture d'iode. Il importe alors d'empêcher la petite ouverture de se cicatriser, le pus provenant des tissus enflammés devant être versé au dehors. Pour y parvenir, tous les jours on y passe une sonde de femme et on y introduit une mèche ; de temps en temps on l'élargit en la cautérisant au moyen d'un crayon de nitrate d'argent ou de potasse caustique.

Les bons effets de ce traitement s'expliquent facilement par ce que nous a appris l'anatomie pathologique. Les kystes hémorragiques sont constitués par une membrane vasculaire qui laisse transsuder du sang. Les injections irritantes, la présence de la canule laissée à demeure, celle même des caillots qui se forment aux dépens du sang provenant du suintement, leur altération, provoquent l'inflammation de cette membrane. Dès lors, il s'y produit des exsudations fibrineuses, véritables caillots qui oblitèrent ou rétrécissent ces petits vaisseaux. La face interne du kyste se recouvre de bourgeons charnus et suppure ; et dès lors toute crainte d'hémorragie a disparu. Cependant le malade n'est

pas sauvé ; il peut périr d'épuisement ou d'infection purulente. Ces conséquences funestes sont d'autant plus à craindre que la surface suppurante est plus vaste, c'est-à-dire que le kyste est plus volumineux. Il faut donc opérer ces tumeurs le plus tôt possible, et dès qu'on en a reconnu l'existence ; car elles ont une tendance continuelle à s'accroître.

M. Stromeyer, professeur à l'Université de Kiel, qui a publié en 1850 un travail sur les kystes hémorragiques du cou, n'opère que lorsque la tumeur a atteint son plus haut degré de développement ; s'il le faut, pour arriver là il attend des années entières. J'avoue que je ne comprends pas la raison de cette manière d'agir : plus la tumeur est volumineuse, plus l'opération est grave, d'abord par suite de l'étendue de la surface qui fournit le sang, ensuite par celle de la surface enflammée. Il est rationnel d'opérer le plus tôt possible ; et lorsque la tumeur est trop volumineuse, loin d'y voir une circonstance favorable, je reculerais devant l'opération, à moins que la respiration ou la déglutition ne fussent gênées par la compression.

Je n'ai jamais été obligé, comme M. Stromeyer, de recourir au tamponnement pour arrêter l'hémorragie, et j'attribue ce fait à la différence de mon procédé opératoire. Le professeur de Kiel met d'abord le sac à découvert par une longue incision ; puis il le vide par une ponction, et l'incise ensuite dans toute sa longueur. Il ouvre ainsi une large porte à l'hémorragie, et l'on conçoit que le tamponnement puisse devenir nécessaire. Moi, au contraire, je fais une petite ouverture, le sang exhalé consécutivement s'amasse de nouveau dans le sac, s'y coagule, et empêche ainsi l'hémorragie de continuer indéfiniment : cet effet est produit d'autant plus sûrement que la compression du sac et les injections irritantes concourent à le déterminer. Il est du reste bien facile de boucher la canule pour empêcher toute perte de sang. La méthode de M. Stromeyer a d'autres inconvénients : en créant tout à coup une large plaie librement ouverte à l'air, elle favorise la production de l'infection purulente à laquelle l'emploi de la teinture d'iode, du nitrate d'argent, ou du caustique de Vienne met au contraire obstacle. Enfin elle laisse une énorme cicatrice.

Autrefois j'incisais aussi largement les kystes du cou et je les remplissais de charpie pour les enflammer ; mais j'ai bientôt reconnu les inconvénients de cette méthode, et depuis longtemps j'ai adopté celle que je viens de décrire. Je dois faire remarquer

que j'emploie la teinture d'iode dans ces cas depuis que M. Velpeau l'a préconisée dans l'hydrocèle ; auparavant, je faisais les injections avec de l'alcool étendu, ou avec une solution de nitrate d'argent, de potasse caustique, ou de caustique de Vienne. J'ai essayé aussi d'ouvrir la tumeur au moyen de la potasse caustique, comme on le verra dans une des observations suivantes, et d'inciser crucialement l'eschare. On provoque ainsi l'inflammation en même temps qu'on ouvre le kyste. Ce traitement a été suivi de succès ; cependant je lui préfère la méthode précédente parce qu'il expose à la production d'une cicatrice plus large, et qu'avec lui il serait plus difficile de mettre obstacle au renouvellement de l'hémorragie. M. Bonnet, de Lyon, a imaginé de traiter les kystes du cou par un séton dont la mèche est enduite de pâte de chlorure de zinc. Ce procédé possède encore à un plus haut degré l'inconvénient que je viens de signaler. Il a en outre celui d'occasionner de violentes douleurs. Je ne puis donc le préférer à ceux que j'ai essayés et qui m'ont complétement réussi.

Voici quelques observations de kystes hémorragiques du cou qui montrent l'application de la méthode que je viens d'exposer.

VIII^e^ OBSERVATION.

Julie-Josephe Hulet, messagère, âgée de vingt-huit ans, d'une forte constitution, née à Mousty, se présenta à la clinique de l'hôpital Saint-Pierre, le 10 mars 1832. Elle portait au côté gauche du cou, accolée à la trachée artère, une tumeur de la grosseur du poing d'un adulte. Cette tumeur existait depuis neuf ans ; elle avait augmenté lentement, mais progressivement de volume.

Elle était arrondie, égale, offrant de la résistance et de la fluctuation ; on y percevait des pulsations très-distinctes. Je reconnus que ces pulsations étaient dues, non à un mouvement d'expansion, mais à un mouvement de soulèvement déterminé par l'artère carotide ; ce n'était donc pas un anévrysme. Je fis la ponction au moyen d'un gros trocart ; il s'écoula une grande quantité de sang noirâtre ; je reconnus que c'était un kyste sanguin. Je retirai la canule, que je remplaçai par la sonde cannelée ; j'agrandis l'ouverture au moyen du bistouri, et j'y introduisis une mèche de charpie pour irriter les parois du sac. Repos ; diète.

Le lendemain, 11 mars, j'enlevai la mèche, et il s'écoula du sang rouge vermeil. La douleur et l'inflammation étaient peu prononcées ; même régime.

Le 12, l'inflammation est devenue forte ; il s'écoule encore de la sérosité sanguinolente ; céphalalgie, fréquence du pouls, inappétence, pommettes injectées, peau chaude et sèche. Saignée de huit onces, cataplasme émollient sur la tumeur, diète.

Le 13, l'inflammation persiste, la douleur a augmenté d'intensité ; un peu de sommeil pendant la nuit, peau chaude et moite, langue bonne. La plaie fournit un peu de sérosité trouble et rougeâtre. Cataplasmes émollients, diète.

Le 16, l'inflammation diminue ; presque plus de douleurs ; pouls moins accéléré ; sécrétion d'une sérosité purulente. On commence à donner quelques aliments.

Le 20, l'inflammation est tombée, le gonflement a beaucoup diminué ; l'ouverture se ferme et menace de ne plus laisser bientôt passer les liquides sécrétés par les parois du sac. On l'agrandit en la cautérisant au moyen du nitrate d'argent. Sérosité purulente noirâtre et fétide, sécrétée abondamment.

Le 21, la cautérisation a amené un surcroît d'inflammation : de nouveau face vultueuse, cou gonflé et rouge, inappétence ; le pus reste séreux, brunâtre et fétide. Saignée de huit onces ; cataplasmes émollients, diète.

Le 25, il y a un peu de pus blanc, crémeux ; il y a toujours de la fièvre.

Le 27 et le 28, mieux ; injections avec une once de miel délayé dans quatre onces d'eau.

Les jours suivants la suppuration s'améliore, elle devient graduellement plus épaisse et moins fétide. Le volume de la tumeur diminue.

Le 2 et le 4 avril, j'agrandis encore l'ouverture au moyen de la pierre infernale.

Le 7 avril, la suppuration est belle, crémeuse ; elle n'est plus fétide. Le 19, le volume de la tumeur a diminué des deux tiers. Le 23, l'ouverture s'étant considérablement rétrécie, je l'élargis au moyen d'un trochisque de minium. La suppuration diminue rapidement. L'opérée sort de l'hôpital le 30 ; la cavité du kyste est complétement oblitérée, et il ne reste plus qu'une petite plaie qui marche rapidement vers la cicatrisation. Le kyste est remplacé par un noyau dur et fibreux.

Le 22 mars 1833, Julie Hulet se représenta à l'hôpital ; elle dit n'avoir plus souffert ; la tumeur fibreuse qui avait pris la place du kyste avait presque disparu.

IXe OBSERVATION.

Jacques Storms, âgé de quarante ans, né et demeurant à Wespelaer, d'un tempérament sanguin, entra à l'hôpital Saint-Pierre le 22 août 1845. Il portait depuis cinq ou six ans à la région du cou une tumeur qui augmentait lentement, mais progressivement de volume; elle s'étendait, lors de son entrée, depuis le maxillaire inférieur et l'apophyse mastoïde jusqu'à la clavicule, et depuis la ligne médiane jusque sur le bord externe du muscle trapèze. Elle était rénitente, indolore, et offrait une fluctuation manifeste; voulant obtenir d'emblée une ouverture assez large pour éviter les incisions et les cautérisations répétées employées dans le cas précédent, je voulus essayer l'emploi de la potasse caustique. J'en appliquai un assez gros morceau; deux heures après, il avait produit une eschare grande comme une pièce de deux francs; il fut retiré, et l'eschare fut incisée crucialement; il s'écoula environ une livre de sang noirâtre liquide, et la tumeur s'affaissa complétement. Je fis des injections excitantes, j'introduisis des bourdonnets de charpie attachés à un fil, et je recouvris le tout d'une large bande d'emplâtre agglutinatif qui faisait presque le tour du cou. Quinze à vingt heures après, la tumeur avait repris son volume primitif; la peau qui la recouvrait était rouge et chaude; il y avait de la fièvre, peau brûlante et sèche, soif vive, pouls à quatre-vingt-dix. L'emplâtre étant enlevé, et les bourdonnets retirés, il s'écoula encore une grande quantité de sang, plus ou moins coagulé. Cependant la tumeur ne s'affaissa plus comme la première fois; elle était douloureuse et offrait de la tension. Le sac était fortement enflammé; comme je craignais que cette inflammation n'arrivât à un trop haut degré, je prescrivis une saignée générale, vingt sangsues sur la tumeur, et deux grains de tartre stibié en lavage.

Le lendemain, 23 août, la fièvre a diminué; la tumeur reste volumineuse, dure, douloureuse; il s'en écoule un liquide sanguinolent assez abondant. Nouvelle application de sangsues; éméto-cathartique, pansement à plat.

Le 24, plus de fièvre; le sac sécrète du pus. Les jours suivants, la suppuration devient de plus en plus abondante. Le pansement consiste dans l'introduction de mèches de charpie dans le kyste. Le malade se lève, se promène et mange.

Le 1er juin, il demande sa sortie. Un mois plus tard, je le revis; tout avait marché régulièrement; seulement il s'était formé

un abcès dans un des points autrefois occupé par le sac. Sans doute, une portion de celui-ci avait été séparée du reste par l'inflammation adhésive de ses parois, et la suppuration y avait continué. J'ouvris cet abcès. Le 1er novembre, je revis encore cet homme; il était complétement guéri; il ne lui restait que la cicatrice du caustique, et une petite tumeur dure, fibreuse, résultat de l'oblitération du kyste. Le malade, dont le courage était à toute épreuve, me proposa de l'enlever; je l'éloignai de cette idée. Je le revis quelques années après et je me félicitai de ne pas avoir accédé à sa demande.

Xe OBSERVATION.

Édouard Arnagel, âgé de vingt ans, de tempérament lymphatique, demeurant à Laeken, entra à l'hôpital Saint-Pierre le 28 août 1845. Il portait au cou une tumeur limitée en haut par la mâchoire inférieure et l'apophyse mastoïde, en bas par la clavicule, en dedans par la ligne médiane, en arrière et en dehors par le muscle trapèze. Cette tumeur était indolore, rénitente, fluctuante, sans chaleur ni changement de coloration à la peau. Elle avait déjà été ponctionnée plusieurs fois, et selon le dire du malade, il en sortait un liquide sale et brunâtre; mais elle reprenait toujours au bout de peu de temps son volume primitif. Elle s'accroissait du reste progressivement, quoiqu'avec beaucoup de lenteur. Je pratiquai la ponction au moyen d'un gros trocart; il s'écoula environ une demi-livre de matière rouge, brunâtre, semi-liquide, renfermant de nombreux grumeaux; évidemment, c'était du sang altéré avec de la fibrine coagulée. Je fis une injection avec une solution de caustique de Vienne. Le trocart fut remplacé par un bout de sonde en gomme élastique fixé au moyen d'un fil tourné autour du cou.

Le lendemain, une sérosité sanguinolente, rouge, s'était écoulée par la sonde; le sac n'avait pas contracté d'inflammation. Je promenai la sonde sur les parois du sac, puis j'y poussai une injection d'eau qui fit sortir des débris de caillots. Cela fait, je pratiquai une injection irritante avec une solution de caustique de Vienne, et j'ordonnai de la répéter plusieurs fois dans le courant de la journée, jusqu'à cessation de l'écoulement du sang.

Le 30, la tumeur est à peu près revenue à son volume primitif; cependant l'inflammation n'a pas une grande intensité. Ayant promené la sonde dans l'intérieur du sac et y ayant injecté de l'eau, celle-ci revint teinte en rouge et ramenant avec

elle de nombreux débris de caillots. Continuation des injections avec la solution de caustique de Vienne.

Le 31, l'inflammation est devenue suffisante; il s'écoule par la plaie une sérosité purulente. La sonde est laissée en place.

Les jours suivants, la tumeur diminue graduellement et la matière prend les caractères du pus louable.

Le 13 septembre, Arnagel est très-bien; le kyste fournit un pus de bonne nature. Il demande sa sortie de l'hôpital.

Le 30, la cicatrisation était complète; il ne restait de la tumeur qu'un noyau dur et fibreux qui ne gênait en aucune façon.

Le 19 novembre, il se représenta à la clinique. Il ne restait qu'une légère cicatrice, trace de la ponction; la tumeur fibreuse signalée précédemment existait encore, mais elle avait diminué de moitié, et n'était plus apparente pour les personnes non prévenues.

XI^e^ OBSERVATION.

Mademoiselle Élisa De B..., de Liége, âgée de quarante-quatre ans, demeurant à Schaerbeek, rue du Moulin, était atteinte d'une tumeur au cou pour laquelle elle consultait M. le docteur Varlez. Celui-ci ayant entendu dire que j'avais obtenu plusieurs succès en traitant ces tumeurs par la ponction, me pria de l'accompagner chez sa malade. C'était en 1846.

La tumeur, située à la partie latérale et antérieure du cou, offrait le volume d'une grosse orange; elle gênait la respiration et provoquait des congestions vers la tête lorsque la malade se baissait.

Vers cette époque le professeur De Lavacherie ayant opéré plusieurs tumeurs du cou, cette demoiselle était allée le consulter. Il lui avait représenté l'opération comme très-grave; elle recula en présence des conséquences fâcheuses qui pouvaient en résulter. Je la rassurai, et parvins à lui persuader que je ferais disparaître sa tumeur sans opération grave, sans mettre sa vie en danger.

La tumeur était rénitente, elle offrait une fluctuation manifeste et augmentait très-lentement de volume; c'était donc une tumeur enkystée. Au moyen d'un gros trocart aplati, je fis la ponction de cette tumeur; il en sortit environ un demi-litre d'un liquide sanguin noirâtre, semblable à une décoction de café. Elle se remplit aussitôt de nouveau; je remplaçai la canule du trocart par un bout de sonde en gomme élastique

du n° 5 ou 6; je le maintins en place au moyen d'un ruban tourné autour du cou, et je le bouchai hermétiquement.

Le lendemain j'enlevai le bouchon de la sonde; il en sortit une tasse de sérosité sanguinolente; je n'en laissai pas échapper davantage.

Le surlendemain, la présence de la sonde avait développé une inflammation assez forte; le bouchon ayant été enlevé, il sortit un liquide moins sanguinolent et moins abondant que la veille. En faisant exécuter des mouvements à la canule et pressant sur la tumeur, j'en fis sortir des lambeaux fibrineux, vermiformes qui indiquaient que des caillots s'étaient formés. Je les rompis en tous sens et rebouchai la canule.

Le troisième jour l'inflammation était violente; la pression provoquait de vives douleurs. Je rompis de nouveau les caillots en faisant exécuter des mouvements à la sonde et en opérant le massage de la tumeur, autant que l'inflammation et la douleur le permettaient. J'y poussai ensuite des injections d'eau tiède, et je fis ainsi sortir une quantité assez considérable de détritus de caillots.

Le quatrième jour, je fis des injections très-abondantes; il sortit encore quelques caillots et un peu de pus. A partir de ce moment le suintement sanguin cessa tout à fait et la quantité de pus s'accrut pendant les jours suivants.

Le même pansement fut continué pendant plusieurs semaines. De temps en temps, lorsque l'inflammation se ralentissait, je rendais les injections aromatiques ou excitantes en ajoutant à l'eau de la teinture d'iode ou de l'esprit de vin camphré.

Le kyste devint dur et épais et contracta adhérence avec les téguments; je retirai alors la canule pour la remplacer par une mèche qui maintenait l'ouverture.

Pendant plusieurs mois encore on fit des injections au moyen d'une seringue à laquelle s'adaptait un bout de sonde en gomme élastique.

Cependant la tumeur restait stationnaire; il y avait de la fièvre avec exacerbation tous les soirs, et je craignis le développement de l'infection purulente. Heureusement après quelques temps la suppuration diminua et la cavité du kyste s'oblitéra.

Mademoiselle Élisa De B... retourna alors à Liége, la cicatrisation s'opéra complétement; mais il resta à la place du kyste une tumeur dure, fibreuse, compacte, assez considérable. On lui en proposa l'extirpation; comme je lui avais prédit que cette

tumeur diminuerait d'elle-même, elle refusa de s'y soumettre. En effet, un an à dix-huit mois après, elle avait beaucoup diminué. Il y a peu de jours, les parents de cette demoiselle, desquels je tiens ces détails, m'apprirent qu'on n'apercevait plus au cou qu'une cicatrice à peine visible ; au-dessous de la peau on sentait encore une induration dans le tissu cellulaire, mais à la vue elle ne paraissait presque plus.

Cette observation démontre que la présence de la sonde et celle des caillots au sein de la cavité peuvent suffire, même sans injections, pour amener un degré convenable d'inflammation.

La fin prouve combien la nature suffit parfois pour éviter des opérations délicates et qui peuvent devenir mortelles.

XII^e^ OBSERVATION.

Christine Broche, âgée de vingt-deux ans, tempérament lymphatico-nerveux, demeurant à Bruxelles, rue Haute, hôtel de Paris, se présenta à la clinique de l'hôpital Saint-Pierre, le 10 février 1849. Elle portait à la partie latérale gauche du cou une tumeur dure du volume d'un œuf de poule, semblant partir de la trachée artère. Une ponction exploratrice en fit sortir un liquide couleur marc de café.

La tumeur fut immédiatement vidée à l'aide d'un fort trocart ; il en sortit un liquide noirâtre, mêlé de grumeaux. J'y poussai une injection de teinture d'iode mêlée à environ deux parties d'eau ; je remplaçai la canule du trocart par un bout de sonde en gomme élastique, que je bouchai et que je fixai au moyen d'un cordon tourné autour du cou.

Le lendemain 11, la tumeur a repris son volume primitif ; les bords de l'ouverture offrent une teinte bleuâtre, violacée, comme ecchymotique. La sonde étant débouchée, il en sort un sang rouge et liquide. Il n'y a pas d'inflammation. Je fais une injection de teinture d'iode pure, après avoir nettoyé le sac par une injection d'eau tiède ; je laisse la sonde à demeure.

Le 12, la tumeur a de nouveau acquis presque son volume primitif. Elle est douloureuse au toucher ; il y a une inflammation commençante. La canule étant ouverte, il en sort un peu de sérosité sanguinolente ; en palpant la tumeur, on y sent un caillot. Je le dilacère en faisant exécuter à la sonde des mouvements en sens divers, et j'en expulse de nombreux fragments au moyen d'injections d'eau tiède.

Le 13, la tumeur est très-douloureuse et très-gonflée ; cependant, la sonde étant débouchée, il ne s'en échappe rien, une injection d'eau en sort légèrement trouble et nuageuse. Il sort aussi de petits caillots. Il y a un peu de fièvre.

Le 14, l'inflammation s'est encore accrue ; la fièvre est devenue plus intense. La sortie des liquides, les injections rencontrent un obstacle presque invincible dans le gonflement de la tumeur dont la pression n'est presque plus supportable. J'ôte la sonde en gomme élastique, je la remplace par la sonde cannelée, et conduisant le bistouri sur celle-ci, j'élargis l'ouverture de quelques lignes ; il en sort du pus ; je dilacère le restant des caillots au moyen d'une sonde de femme, et je lave le sac par d'abondantes injections. Cataplasmes émollients.

Le 15, l'inflammation a diminué ; les douleurs sont moins vives ; il s'écoule un pus crémeux, louable, très-abondant. Injections, cataplasmes.

Quelques jours après, l'excès d'inflammation a totalement disparu ; la plaie suppure bien. On continue les injections ; de temps en temps, on cautérise les bords de l'incision au moyen de la pierre infernale, pour l'empêcher de se fermer avant que le travail de suppuration et d'adhésion ne soit tout à fait terminé. Lorsque l'inflammation languit et que le pus devient séreux, je recours de nouveau à la teinture d'iode.

Deux mois après, la petite ouverture était cicatrisée ; il ne restait de la tumeur qu'un noyau dur, offrant le volume d'une grosse amande. Fort de l'expérience que m'avaient donnée mes observations antérieures, je n'hésitai pas à promettre à cette jeune personne la diminution graduelle de ce noyau ; je lui ordonnai d'y faire des onctions avec une pommade d'iodure de potassium.

DE QUELQUES COMPLICATIONS DES KYSTES DU COU. — CONCLUSIONS.

D'après ce qui précède, il est facile de déduire la conduite à tenir lorsqu'on croira avoir affaire à des kystes du cou. Il faudra commencer par pratiquer une ponction exploratrice qui les fera distinguer des tumeurs solides ; cette ponction indiquera aussi si le kyste est séreux, hématique ou hémorragique. Le diagnostic entre ces deux dernières variétés ne peut être établi par ce moyen, le liquide étant souvent identique dans l'un et l'autre. Mais si le kyste est déjà volumineux et tend à s'accroître encore, on doit croire à l'existence d'un kyste hémorragique. Du reste, la précision du diagnostic est ici sans importance, la conduite du chirurgien étant la même dans tous les cas.

Je pratique la ponction définitive au moyen d'un gros trocart rond ou aplati. A mesure que le liquide s'écoule, je comprime la tumeur de façon à en rapprocher les parois; cette manœuvre met obstacle à l'écoulement du sang dans les kystes hémorragiques. Lorsque la tumeur est vidée, j'y pousse une injection avec de la teinture d'iode plus ou moins étendue, une solution de potasse caustique, de caustique de Vienne, ou de nitrate d'argent. Ces injections ont toutefois le grand inconvénient de tacher le linge des malades, de laisser pendant plusieurs jours des marques sur les parties voisines de la tumeur, et d'offenser les mains de l'opérateur et des aides. Je ne serais donc pas éloigné d'en revenir au moyen que je mettais en usage avant qu'on ne fît mention de tous ceux-là, et de me servir tout simplement d'alcool pur ou étendu d'eau. C'est toujours, en définitive, la même méthode, ayant le même mode d'action sur les tissus, déterminant une inflammation adhésive et mettant, lorsqu'il y a lieu, obstacle à la production de l'hémorragie. L'injection étant pratiquée, je remplace la canule du trocart par une canule en gomme élastique taillée en biseau à son extrémité, et maintenue par un lien autour du cou.

L'inflammation peut devenir trop violente, ou bien le pus peut prendre une forme grumelée, de sorte qu'on ne puisse plus le faire sortir par la canule ou par une sonde de femme introduite à sa place. Alors, et alors seulement, j'introduis une sonde cannelée à la place de la canule, et j'agrandis l'ouverture de quelques lignes au moyen du bistouri, de manière à pouvoir y passer le petit doigt pour rompre les caillots et détacher de la surface des kystes les flocons adhérents, et à pouvoir y placer une mèche chargée d'un excitant quelconque, si je le juge nécessaire. De cette façon, j'amène immédiatement le dégorgement de la tumeur, et j'évite l'extension de l'inflammation aux parties circonvoisines.

Cette méthode offre surtout de grands avantages chez les femmes qui tiennent plus à être débarrassées de ces tumeurs, et auxquelles il faut toujours se garder de faire des cicatrices larges et apparentes.

Jusqu'à présent, j'ai parlé uniquement des kystes à l'état simple, des kystes isolés. Mais ils n'existent pas toujours ainsi; quelquefois ils compliquent d'autres maladies, et alors la conduite du chirurgien devra s'en ressentir.

La première de ces complications est celle de kystes multiples. Dans ce cas, la tumeur est multilobulée; quelquefois l'un

des kystes renferme un liquide différent de celui d'un autre; ainsi l'un peut renfermer de la sérosité, un autre un liquide noirâtre. Ces tumeurs pourront être opérées comme les précédentes; seulement il faudra autant de ponctions qu'il y a de kystes. Si deux de ceux-ci se touchent, on peut les faire communiquer, ce qui épargne une cicatrice à la peau. Pour le reste, le traitement est le même.

Les kystes tant séreux qu'hématiques et hémorragiques, compliquent parfois le goitre ordinaire, l'hypertrophie du corps thyroïde. Ce sont des cas semblables que les anciens, qui ne connaissaient pas les kystes, appelaient goitres séreux ou lymphatiques. Ce sont de tels goitres que Dupuytren a pu faire diminuer par l'emploi du séton, moyen sans action sur l'hypertrophie elle-même. C'est aux kystes hémorragiques compliquant celle-ci que Boyer me semble faire allusion dans le passage suivant : « Une terminaison du goitre, plus rare encore que le cancer, est la transformation de la thyroïde en une substance fongueuse; dans ce cas, la tumeur se ramollit à mesure qu'elle augmente de volume, et donne aux doigts qui la touchent une sensation illusoire de fluctuation. Si faute d'attention, et la prenant pour un abcès, on l'ouvre, il survient une hémorragie difficile à arrêter, qui se renouvelle de temps en temps, et peut-être sera mortelle. Il sort par l'ouverture un fongus rougeâtre, mollasse, qui s'écrase sous les doigts, verse du sang pour peu qu'on le touche, et qu'on ne parviendra jamais à détruire complétement, soit qu'on le brûle soit qu'on le coupe. »

Nous savons parfaitement bien aujourd'hui que le goitre proprement dit, ou l'hypertrophie de la glande thyroïde, ne se ramollit jamais. Ce que Boyer a observé, ce sont évidemment des kystes hémorragiques compliquant des goitres. Il en a clairement indiqué les principaux caractères, même la fluctuation, qu'il regardait à tort comme illusoire. C'est un cas de ce genre que M. Michaux a relaté dans sa première observation (*Bulletin de l'Académie*, tome XI, n° 8, page 668). Quant au fongus mollasse que Boyer a vu sortir par l'incision, j'ai à peine besoin d'ajouter qu'il était constitué par la membrane vasculaire du kyste, supportée par le tissu thyroïdien hypertrophié.

Quelle conduite le praticien doit-il tenir dans ces cas?

Le goitre hypertrophique est une de ces affections auxquelles un praticien prudent ne touche presque jamais, à moins de circonstances toutes exceptionnelles. Dupuytren, MM. Roux, Bon-

net, etc., ont pratiqué de ces opérations, et ils s'en sont repentis, ils en ont fait leur *mea culpa*. Dans ce cas il faut savoir résister aux instances des malades, et surtout des femmes, que la coquetterie empêche de réfléchir aux dangers qu'elles courent.

Voici une observation qui peut servir à indiquer la conduite qu'il faut suivre dans cette circonstance.

XIII^e^ OBSERVATION.

Le 25 novembre 1852 est entrée à l'hôpital Saint-Pierre la nommée Barbe Hallied, de Boitsfort, âgée de dix-neuf ans.

Elle porte une tumeur énorme, de consistance ferme et inégale occupant toute la région antérieure du cou, qui paraît comme aplati d'avant en arrière et élargi latéralement. Cette tumeur offre la forme du corps thyroïde fortement hypertrophié surtout dans ses lobes latéraux. Elle a débuté il y a environ trois ans par le côté droit et a augmenté progressivement de volume. Les deux carotides sont repoussées sur les côtés, et en arrière où on les sent battre avec beaucoup de force; les artères thyroïdiennes ont acquis un volume énorme. Des veines volumineuses sillonnent cette tumeur.

Lors de l'entrée de cette femme à l'hôpital, elle était anémique, débilitée par un mauvais régime. Elle avait des vertiges, des éblouissements, de l'oppression. Il y avait là un champ ouvert pour pratiquer une belle opération avec dissection délicate, ligature de plusieurs artères, et rétablissement final du cou dans sa forme primitive. Mais l'hémorragie tant veineuse qu'artérielle, la syncope, l'épuisement, l'introduction de l'air dans les veines, fallait-il les braver? Et les dangers consécutifs résultant de cette énorme plaie du cou, l'épuisement suite d'une suppuration abondante, l'hémorragie consécutive, l'infection purulente, le risque de lier le nerf de la huitième paire, etc., ne fallait-il pas prendre en considération tous ces dangers, que M. Michaux a si bien énumérés dans une observation que j'ai citée précédemment? L'infection purulente surtout est fréquente à la suite des plaies du cou, ce qu'explique le nombre considérable de vaisseaux et de ganglions lymphatiques rassemblés dans cette région. Du reste, j'avais devant moi les exemples de mes devanciers qui ont eu la franchise d'avouer leurs revers.

Je n'ai donc pas cru devoir toucher à la tumeur de cette jeune fille. J'ai agi conformément aux préceptes de M. le professeur Alquier: « C'est là une fâcheuse manière de considérer la chirurgie, que de trouver plausible un talent qui méconnaissant l'esprit de *l'art de guérir*, trouve louable la dextérité exercée au détriment des malheureux. »

Je me suis borné à prescrire à cette jeune personne un régime analeptique, des ferrugineux, les iodures à l'intérieur et les applications de teinture d'iode sur la tumeur. Aujourd'hui (février 1853), elle est bien portante; sa constitution est bonne; elle n'offre plus ni symptômes du côté de la tête, ni oppression. La peau est moins tendue et la tumeur semble avoir diminué de volume. En un mot, si ce n'était la difformité, elle serait tout à fait à l'état normal. Celle-ci vaut-elle la peine de faire courir tous les dangers énumérés précédemment? Je ne le pense pas. La malade se trouve tellement bien qu'elle ne voudrait même plus consentir à se laisser opérer.

Voilà un cas de goitre simple et voilà la conduite à tenir dans cette circonstance. Que faut-il faire lorsque, comme cela arrive souvent, des kystes le compliquent?

Il ne faut pas davantage y toucher; à moins cependant que des symptômes de congestion cérébrale ou de suffocation n'y obligent; car ce n'est nullement la même chose d'agir sur un kyste situé dans des tissus sains, ou sur un kyste contenu dans une glande thyroïde hypertrophiée et vascularisée. Voici un cas de cette espèce où l'opération fut pratiquée et où je faillis avoir à m'en repentir. Je la rapporte uniquement afin de prémunir les praticiens contre la tendance à entreprendre trop facilement de semblables opérations, qui peuvent devenir très-préjudiciables aux patients.

XIV^e^ OBSERVATION.

Mademoiselle G.-M. de S...., âgée de trente et un ans, vint me consulter, en 1854, pour un goitre énorme de forme trilobée. Les deux lobes latéraux de la glande thyroïde étaient fortement développés. Le lobe moyen faisait au devant d'eux une saillie considérable trilobulée; ils offraient une sensation de fluctuation. Il y avait de fréquentes congestions cérébrales et des accès d'oppression allant jusqu'à la suffocation. En conséquence, je crus devoir enlever sinon la tumeur entière, au moins la partie moyenne qui comprimait particulièrement la trachée-artère. Je procédai à cette opération le 10 novembre 1854. J'incisai longuement les téguments depuis l'os hyoïde jusqu'au bord supérieur du sternum; je le disséquai à droite et à gauche, je cher-

chai à isoler le lobe moyen de la glande, et je le trouvai composé à son tour de trois parties distinctes. J'ouvris la partie centrale ; il s'en échappa une sérosité tenant en suspension des grumeaux, et une matière semblable à du frai de grenouille. Plusieurs artères durent être liées. J'incisai également les parties latérales, qui étaient formées de vacuoles multiples, et je les isolai autant que possible des lobes latéraux ; je liai encore un grand nombre de branches des artères et des veines thyroïdiennes, qui fournissaient une hémorragie en nappe. La malade éprouva une légère syncope ; j'en profitai pour isoler autant que possible le pédicule des parties environnantes, pour l'étreindre au moyen d'une ligature, et mettre ainsi fin à l'hémorragie. La voyant près d'expirer, je me gardai bien d'attaquer les lobes latéraux. Je pansai cette vaste plaie ; un écoulement de sang et de sérosité jetèrent la patiente dans un état de collapsus inquiétant ; une trachéo-laryngite vint compliquer cet état, et je crus un moment la voir succomber des suites de l'opération. Je prescrivis les toniques et les excitants ; au bout de quelques jours l'écoulement sanieux fut remplacé par de la suppuration ; du dixième au douzième jour, les ligatures tombèrent ; quelques jours après j'enlevai la partie de la tumeur qui avait été liée. La plaie marcha lentement vers la cicatrisation, et le 18 janvier 1835, Mademoiselle G.... quitta Bruxelles, parfaitement rétablie de l'opération, mais conservant toujours les deux lobes latéraux hypertrophiés. Des accès de fièvre intermittente vinrent compliquer la fin de sa guérison. Ils cédèrent au sulfate de quinine et à la rentrée de la malade dans ses foyers. Je fus aidé dans cette grave opération par mes collègues, MM. les docteurs Guiette, Lequime, Vanhuevel et Leto, etc. Ces Messieurs pourraient attester à quels dangers la malade fut soumise.

L'histoire de cette malade démontre combien il faut être avare de semblables opérations ; car, c'est par miracle en quelque sorte que cette personne n'a pas succombé. Ici je m'appliquerai à moi-même ce que j'ai dit précédemment des opérateurs qui enlèvent les tumeurs fibreuses résultant de l'oblitération des kystes. Dans l'un comme dans l'autre cas, c'est de la hardiesse, de la témérité ; ce n'est point de la chirurgie transcendante, rationnelle, conservatrice, de la chirurgie sage et prudente. Une seule circonstance a motivé cette opération, c'était les accès de suffocation ; je n'ai point fait un acte de complaisance : je croyais lui prolonger la vie, et pour atteindre ce but, je l'exposais vingt fois à la mort !

Aujourd'hui, je n'entreprendrais plus une opération aussi chanceuse. Cependant, je ne repousse pas toute opération dans cette circonstance. Seulement, après avoir reconnu la présence des kystes et leur nature par une ponction exploratrice, je les traiterais selon la méthode que j'ai exposée, au moyen de la ponction et des injections irritantes. Ces préceptes sont applicables aux kystes hémorragiques et hématiques aussi bien qu'aux kystes séreux.

Les kystes peuvent également compliquer les tumeurs squirrheuses et encéphaloïdes du cou. On conçoit que dans ces cas, encore plus que dans le précédent, on ne pourra toucher à ces tumeurs ; le faire serait abuser de la médecine opératoire et contrevenir aux véritables principes de l'art.

Fig. 1.

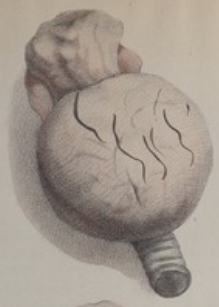
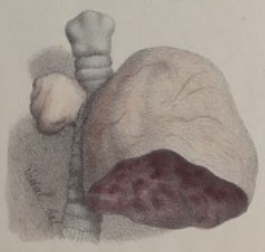


Fig. 2.

Fig. 3.



The History of the Case of Wm. Forder.

August 21st, 1853. In the presence of E. Newson, an old, highly respectable, and much valued servant, who felt and had taken a great interest in his well-doing; I received from his own lips, which but a short time before had been incapable of utterance, the following history of the case of—

William Forder, of Wellington Lane, St. Giles', Norwich, age 55 years, married, and the father of ten children; he had been an inveterate snuff-taker, and had indulged in the most dissipated and irregular habits; but had nevertheless enjoyed tolerably good health up to three years and a half ago, when he accidentally fell from a ladder, and his shoulder became fractured; he was otherwise much bruised about his head, and other parts of his body—and five months elapsed ere he recovered.

In October, 1852, while engaged upon a job of carpentering in the country, he was attacked by bleeding from the nose, which recurred at intervals. In November, he felt a slight soreness in the left nostril, and a few days afterwards he perceived a small lump, about the size of a large pea, on the floor of it, just within the external opening, and close to the septum, or, "partition of the nostrils." It continued to grow gradually till Christmas time, when he returned home, and placed himself under the medical officers at one of the city institutions. Nothing was done for a few days, beyond giving him some medicine; at length, one of the surgeons, mistaking it for a polypus, and assisted by his colleague, attempted to remove it—it seemed somewhat firm, and a slight grating sensation, like the crumbling of soft bone, followed the gripe of the forceps—considerable bleeding ensued. A week afterwards, another like attempt was made by the surgeons to tear it away, but with no better result, a small portion only came away—the whole of the base of the growth remained, which after a day or two presented a red and gristly appearance. He returned into the country, about the latter end of January, to finish his job, when the nose-bleeding becoming more frequently troublesome, he consulted a surgeon there, who applied alum and caustic, which instead of checking it, occasioned a more rapid growth.

Unable to go on with his work, he came back to his wife and family in March. He again applied to the Surgeons at the Institution referred to, and they again tried to operate upon him, but only succeeded in extracting a few small pieces, "soft, like brains." No great deal of bleeding then followed; the nostril was left nearly full of the diseased growth.

No examination of the jaw or inside of the mouth was made; and the disease was left to take its course, as the surgeons told him "they could do no more for him, it being a bad kind of Polypus, what they called 'malignant;' and that he had better not let *any*body meddle with it again."

It continued to spread in every direction. About the middle of April he was obliged to take to his bed entirely, he having become much reduced and very weak from the recurrences of hœmorrhage to a considerable extent. The whole nose at length became filled; and the growth, now bound down by the tightly distended integuments, forced its way under the upper lip, growing over and blocking up his mouth, except at the left angle of it, and where but a little opening was left him for breathing or taking food, which could only be administered to him in a liquid form through the spout of a teapot.

It was at this juncture, (about the third week in July), that I was requested "to see him for satisfaction;" he feeling persuaded, from what people had told him, that if he could but be admitted into "The Free Hospital for Incurables" he should get relief; a confidence which, despite my assuring him of the probability that he would die under any attempt to remove the disease, it was impossible to shake.

Before receiving him into the Hospital, I took two Members (Clergymen) of the Committee to see him. These gentlemen expressed it to be their opinion, that if there were the remotest chance of relieving the poor fellow by any operation it ought to be done, as it was evident he must die soon if left to contend with the disease. He was accordingly admitted into the Hospital on the 22nd of July. A diet of strong soups, with wine, brandy, &c. was ordered him, and for a week or ten days he was free from hœmorrhage, gained strength, and said he felt himself more comfortable than he had done for a month.

On Friday, July 29th, a cast of his face was carefully made by Mr. Harper, the *Subcurator* of the *Norfolk* and *Norwich Hospital Museum*. A correct drawing also was afterwards made by a talented artist, from which the woodcuts here shown were taken.

On Monday, August 1st, a slight hœmorrhage took place, and he began to feel dispirited, and expressed a fear that I

Representation of the Face before the Operation.

Fig. 1.—Full Face.

Fig. 2.—Side Face.

would not operate upon him. Circulars, as is usual at this Hospital, were sent on the following day (Tuesday) to the Medical Subscribers, requesting them to attend on the Friday, (August 5th) when the operation was performed; a descriptive account of which, by Mr. Spencer Freeman, I shall subjoin.

I will only here add, that fortunate is the Surgeon who, at so anxious a time, has the co-operation of such able and practical Gentlemen, as the Surgeons who so kindly and efficiently assisted me in the case in question; and to whom I feel much indebted, as was the patient. Not a single thing had I to ask for during this most trying operation; with heads clear, eyes open, and hands as steady as ready, each instrument, sponge, or what not, was at my finger's end at the instant I required it.

DESCRIPTIVE ACCOUNT

OF THE

OPERATION PERFORMED UPON WILLIAM FORDER,

AT THE

FREE HOSPITAL FOR "INCURABLES,"

By which (humanly speaking,) his life was prolonged NINE *months!*

On the morning of the 5th of August, 1853, I attended at the Norwich Free Hospital for Incurables by special summons. I met there several other Surgeons, who, as well as myself, are Subscribers to the Institution. It is usual with the Medical Officer at that Hospital, to hold conferences prior to Operations, with all the other medical gentlemen who may be present, relative to the cases about to be operated upon. Every circumstance connected with the history, and the treatment which has been pursued, is then explained and discussed, and future measures determined on. On the occasion in question, we were introduced to the case of WILLIAM FORDER, one of the most horrible and pitiable objects imaginable, labouring under a malignant growth occupying the nose, upper lip, and inside of the mouth; the loathsome and frightful character of which beggars all description by the pen. Some idea, however, of its extent and appearance may be formed from the woodcuts (on the opposite page,) taken from drawings by a clever artist, and *casts* (modelled by the Subcurator of the Norfolk and Norwich Hospital Museum,) which have lately been made the subject of so much notoriety.

Having carefully examined the case, and deliberately weighed

all the circumstances of it, we fully concurred with Mr. Webber in the propriety of making an attempt to afford the sufferer the only chance now left him, and which he, by significant looks and half articulate expressions, implored us to give him. It should be particularly borne in mind, that Forder was told by one and all of us, he might die under the operation; and even should it succeed, it was not likely that he would enjoy any long immunity from disease; but he still persisted in his previously expressed desire to be operated upon, saying, "that he came into the Hospital for that purpose."

It is impossible to conceive a more unpromising or more discouraging prospect than the condition of Forder held out.

There he lay, pale as death, his voice almost extinct, rendering utterance and comprehension of what he said difficult to a degree—his pulse feeble and labouring, the eye betokening rapidly approaching dissolution; in a word, nature seemed all but exhausted from the wearing effects of his dreadful and daily increasing malady, and from his now almost complete inability to take nourishment—which could only be administered by the spout of a tea-pot, introduced at the left corner of his mouth—and through which alone he had been able to breathe for many weeks. By a little manœuvring, with the aid of a candle and small silver speculum, we were enabled to ascertain that the growth did not extend inside the mouth beyond the hard palate.

The patient having been placed on a couch, constructed upon the principal of Earle's bedstead, the trying and anxious work was commenced; each had his post assigned him, and we were cheered on by the self-possession of the Operator and his unanswerable remark, of—"Remember, gentlemen, whatever may be the issue, it is *duty*, not *choice* which we have to consider."

The operator holding somewhat obliquely a double-edged scalpel, began by making an incision in the mesial line, about half an inch below the naso-frontal suture, carrying it down the nose to the lowest healthy point of integument—from that point another incision was made to traverse the boundary of the growth on the right side, and to terminate about three-quarters of an inch beyond the symphisis—this was met by another pursuing a similar course on the left side—the integuments were then freely dissected and reflected, and the whole mass of disease exposed—the portion connected with the sound bony septum was now set free, and a ligature composed of silk and silver wire was, as a precaution against hœmorrhage, made to include, as completely as possible, all the growth external to the

maxillary and malar bones, which was then swept off by one quick cut of the knife. The central third of the maxillary bone with the teeth and greater part of the hard palate were quickly excised with bone forceps—and every remaining visible portion of the disease cut away by a pair of strong curved scissors, leaving all the parts perfectly sound and healthy in appearance; the whole mouth and pharynx were thus displayed, presenting a most frightful and appalling spectacle—looking as if the front of the face had been scooped out from the head. Scarcely any blood was lost; the three or four small divided arteries, being quickly pinched by Mr. Webber's "anti-ligature forceps," immediately ceased to bleed, rendering the tying of the vessels unnecessary. All being now cleared and prepared, the work of restoration was proceeded with; the bony septum was in part cracked through by forceps, about the middle of it, and bent down, thus forming an arched line, and superseding the necessity of a wax bridge, for the support of the integuments in the formation of the future nose.

The obliquely divided edges were accurately lapped upon the corresponding ones, and secured by a stitch or two; the right portion of the upper lip hanging down like a large rat's tail, was now turned up to meet the apex of the nose, and to form a sceptum narium—the portion of its red or mucous edge at and from the angle of turning being first pared off. The left portion of the lip was brought to join it at that angle, so as to make an uninterrupted line of mouth, and a very perfect upper lip. The parts were then secured in their position by sutures and bandages of adhesive plaster, and thus was completed one of the neatest operations ever witnessed.

The operation which took up nearly three-quarters of an hour would have been all done in ten or twelve minutes, had not the patient (whom we did not, of course, attempt to chloroform,) three times, during the performance of it, been attacked by violent convulsions followed by syncope—the last seizure occupying a full quarter of an hour when he appeared to be quite gone; but the cheer of "Hold on Gentlemen" stimulated us to persevere in agitating a strong solution of ammonia close to the face of the patient, and pouring brandy and water down his throat, which resuscitated him. He was at length conveyed back to his bed with human features and a cheerful countenance, a *striking* contrast to the state in which he was taken from it. The wood-cuts (*see page* 11,) taken from drawings and casts made by the artists already alluded to, show the appearance of the patient on the eighth day after the operation.

Stowmarket, June 24th, 1854. S. FREEMAN.

I quite concur in every word Mr. Freeman has written. I shall ever look back with a feeling of much pride and satisfaction, upon the day when I had the opportunity of being present at and assisting Mr. Webber, in the terrific undertaking of the operation on Wm. Forder, which, beset with so much difficulty and danger, was crowned with so gratifying and glorious a result; and I trust I shall, in common with many other country practitioners, ever feel grateful to Mr. Webber for the noble example he has set, and the laudable efforts he has made, to secure for us those advantages which we feel to be so valuable and essential to us in our endeavours to benefit those of the public who come under our care; and long live "the benevolent founder of the Norwich *Free* Hospital," is the fervent wish of

GEO. POTTER.

Attleburgh, June 5th, 1854.

We have read the graphic and very able description which Mr. Freeman has given of the case of William Forder, and of the splendid operation performed upon him by Mr. Webber, to which (it being, in every respect, so lucidly and correctly stated); we have nothing more to add, excepting that we shall ever think of it with much satisfaction; not only as regards our full concurrence in the propriety of the measure, but also as to the part we took in that very extraordinary and trying operation, and one which, we trust we may say, without being charged with presumption, reflects the utmost credit upon "*Surgery in the* COUNTRY;" WHERE, to many of us, the opportunities, *allowed*, are few; a prejudiced surveillance presides; with (as Mr. Webber truly observed, at one of the Hospital meetings,) "a ready censoriousness at hand, to condemn the failure of effort, which was often replete with merit; opposing a serious obstacle to competency, where a judicious and timely encouragement, given to capability, would ensure it, and be the means of saving many a life."

HORACE HOWARD, M.R.C.S.E.—L.S.A.
H. F. HOWARD, M.R.C.S.E.—L.S.A.

New Buckenham, June 1st, 1854.

P.S.—I consider the casts to be well executed, being *quite* accurate; indeed, the patient presented, when I saw him on on the 12th day after the operation, a better appearance than is shewn by the second cast (taken on the eighth day after it), the redness upon the upper lip having entirely disappeared. He was looking wonderfully well; his health was astonishingly improved, and he expressed himself in terms of unbounded gratitude for the great relief afforded him. H. H.

Representation of the Face eight days after the operation, with the wounds all healed.

Fig. 3.—Full Face.

Fig. 4.—Side Face.

The deposition of Rachael Patterson, taken before the Committee of The Norwich Free Hospital for "Incurables," March 6th, 1854.

I am nurse at "The Free Hospital for Incurables." William Forder was brought to the Hospital on a kind of litter, on the 22nd of July, 1853, and at once admitted. He had a most frightful disease growing on his face; he appeared to be in a dying state; he looked as white as death, and was so weak that he could scarcely raise his hand to his face; his mouth seemed to be quite blocked up by the disease. It was with great difficulty that I could understand what he wanted; he could mutter only a word or two now and then, and that not without great effort.

Mr. Webber ordered him strong broth, with wine; arrow root, with brandy; and porter, &c., which were supplied from Mr. Webber's own house; nothing at all solid could be got down; there was no passage through his nose; he breathed from the left corner of his mouth, where the liquids were also passed in, through the small spout of a feeder. He was a dreadful sufferer; he had great difficulty in breathing while he was taking his broth, &c. and was often nearly suffocated in consequence; it was very trying to have to do for him, he was in such a loathsome state.

For a week after he came into the Hospital he daily gained strength; after which he began to flag again, and expressed a fear that Mr. Webber would not operate upon him. I cheer'd him all I could, by telling him how many seemingly hopeless cases I had seen Mr. Webber operate upon with success, and that I was sure Mr. Webber would not pass over any chance of doing him good. Mr. Webber generally saw him twice a day, sometimes oftener. I had strict orders to attend closely to him.

On Friday, the 28th of July, Mr. Harper came and took a plaster of Paris cast of his face. Mr. Webber operated upon him on Friday, the 5th of August. The day before the operation Mr. Webber explained everything to Forder about his case, and the threatening state he was in, when Forder made Mr. Webber understand that he was aware how little chance there was for him; but that he put himself into his hands, and he hoped he would give him the only chance left him.

Before he was put on the operating couch, Mr. Webber, in the presence of the four Medical Gentlemen who came to see, and to assist in the operation, again reminded him of his position, by saying,—"Forder, there is no question that you are sinking, and that you cannot, under your present circumstances,

survive many hours, as you are now unable to take scarcely anything. We all deeply sympathize with you in your dreadful affliction: we are quite disposed to do anything for you, which can reasonably hold out a chance even of relief; but as I told you yesterday, so I cannot honestly forbear to repeat to you now, that you not only must die as it is, but that it is more than probable that you will, if we attempt to operate upon you, die on the couch; and even if we should succeed in removing the disease, there is every reason to expect that it will return, as we consider it to be of a bad kind, what we call 'malignant;' the operation will try you severely; we cannot chloroform you, and the shock to your weak system will be very great, more, probably than it will bear. I have told you the truth. I, as a creature, am ready to do my best for you; the result must be as it shall please Him "who ordereth all things." We can only do our best, as we are bound to do; we cannot command success. Once more I ask you, after what I have sincerely stated to you, is it your desire to be operated upon?" Forder, grasping Mr. Webber's hand very earnestly, with a most imploring look, used all his energy, and muttered out, "Oh yes, Sir; pray do it."

I heard one of the gentlemen say that he would not undertake such an operation if any one would give him £1000. Mr. Webber said, "Remember, as I told you just now, it is duty, not choice that I have to consider—I should be very glad if any one else would do it." Forder was then put on the couch, and the operation was proceeded with. It was a most trying business for all. Forder seemed to die three different times while it was being done; not from loss of blood, for that was very slight, but from the effect of the operation upon his nerves. He was gone a full quarter of an hour at one time, before he could be rallied. One of the gentlemen said. "It is all over *now*, I am afraid." Mr. Webber, who was very firm, replied, "Let us hold on, gentlemen. Shake the ammonia in front of him, and more brandy if you please," which Mr. Webber, pressing back his tongue (the whole face being now laid open), poured down his throat. "All right again, we shall pull through,—well done, gentlemen, you are all most excellent assistants. Thank you, it is all removed, I have done,—the pulse is returned in the wrist—we shall carry him through." Mr. Webber's feelings now overcame him—his heart seemed full, and he left the room for a few minutes; he then returned and dressed the case. Great pains were taken during the operation, to contrive the nose and the lip—the parts were fitted very exactly—it was a wonderfully neat job. The patient was then taken back to his bed, and ordered to answer with his fingers, by holding one up, for "yes;" two, for "no;"

and his hand when he wanted anything, which he was to explain by signs. He was fed through the tube. He could now breathe freely by his nose, which he had not been able to do for some months. He was not allowed to speak or to move his lips, and which was pretty well guarded against by strappings of plaster. He soon fell into a sound sleep, and after an hour woke up much refreshed, his breathing free, and his eyes quite brisk. He soon made me understand how pleased he was that he had not an ache or a pain. He continued to go on well, almost as if nothing was the matter with him. He partook freely of nourishment, and gained strength very fast. On the third day he could raise himself up in the bed with ease; and he wished to be shaved, which Mr. Webber did for him, as far as could be done, as Mr. Webber was fearful that the barber might disturb the parts. On Monday, the fourth day, Mr. Webber removed the dressings, cut and took out the stitches, for all was healed except the small stitch holes. Mr. Webber also snipped away the piece of skin which divided the nostrils; there being nothing at the back of it; he told Forder one good nostril would be better than two small ones, and the point of his nose being brought low down, it would never be observed. After some more strappings had been put on to prevent the parts giving way, Mr. Webber said, "How do you feel now?" Forder answered, "In heaven, sir! Oh! if I had but known you before, how many months of misery you would have saved me, and I could have been at my work now! not that I wish to blame the other doctors, sir, they did to the best of their know, I have no doubt, but it was a bad job for me that I went to them." Fresh plasters were put on the next day (Tuesday). Mr. Taylor, the truss-maker, afterwards came in with Mr. Webber to see him, when Mr. Webber took off the plasters to show him how completely the parts were healed. Mr. Taylor enquired when the operation was done? "Only last Friday, sir," said Forder. "What! only last Friday," said Mr. Taylor—who, turning to Mr. Webber, said, "Sir, I can hardly believe my eyes—if I had not seen it, I could not have believed it—'tis the most wonderful case I have ever seen or heard of."—And then, turning back to Forder, (who told me that Mr. Taylor had almost supported him for many weeks before he came into the Hospital) he said "Forder, you ought to bless Mr. Webber as long as you live." "Yes, sir," said Forder, "and you too; for you kept me alive for Mr. Webber to cure; *Friday* was a *lucky* day for me, sir."

Mr. Crawford Bell came into the ward on Wednesday (the sixth day after the operation), while Mr. Webber was trimming the beard off the upper lip with a pair of scissors, before putting on

some small and narrow straps of plaster. He seemed very much surprised to see the parts all healed; and said to Mr. Webber, "How wonderfully quick it has united! why it is *all* healed!" Mr. Webber made some remarks to Mr. Bell which I did not quite hear, about "too quick for his liking," &c. When Mr. Webber visited Forder on the Thursday (seventh day), he sent for the barber and had him cleanly shaved. After this no more plaster was put on, but a piece of linen, wetted with cold water, was laid on the lip and nose; the inside of the mouth was quite healed, and Forder could now eat meat cut fine, and swallow anything without its escaping through the nostril, by holding his head a little back.

On Saturday (the 13th), which might be said to be only eight days after the operation (for it was not done till two o'clock on the 5th), I went out for an hour to see my daughter, who was ill; when I came back I found that Mr. Harper had been with Mr. Webber, and taken another cast of the face, which Forder said "didn't hurt him a bit!" On the 17th of August (twelfth day after the operation), Forder was taken out for an airing, in a chair lent by Mr. Taylor; he was gone half-an-hour. He told me, when he came back, he had been to Mr. Taylor's, to thank him for his great kindness to him. On Sunday, the 20th, (seventeenth day), he walked over to Mr. Webber's garden, and sat there in the sun; after this he walked out every day, and generally went home to see his family. He was allowed to remain in the Hospital for several weeks, in order that he might have better living than he could get at home. Mr. Webber frequently sent him a piece of fish, fowl, or meat from his own table, and some porter, called "Dent's porter," which Forder said seemed to nourish him more than anything; he had every thing allowed him which he wished for.

He was made an out-patient on the 22nd of September, which he seemed to be not pleased at. While in the Hospital he had often expressed a wish to have a wax cast of his face, as it was before the operation. He took one which stood in the closet in the ward away with him. He told me he had asked Mr. Webber for one, and that he told him that 8s. 6d. was Mr. Harper's charge for it; but that he would speak to the Committee, who, he dare say, would give him one. On the Monday after Forder was made an out-patient, he came to the Hospital to see Mr. Webber, who was then dressing some of the cases. He seemed very sulky; he walked into the ward where Mr. Webber and another gentleman were, with his hat on, which Mr. Webber told him "he had better take off, except he wished to be taken for a hat peg."

Forder then asked Mr. Webber to look at his mouth. Mr. Webber did so; and said, "Yes, there is a small piece of fungus; you had better come into the Hospital and have it cut away, it can be done in a moment." Forder said "no, he should not; and that one of the Surgeons of the Norfolk and Norwich Hospital, (Mr. Firth I think was the name he mentioned), had been with the parish Surgeon to see him, and had told him that the operation ought never to have been done, and that he recommended that some Chloride of Zinc should be applied to it." Mr. Webber said, "You may do as you like; I advise you not to have it burnt, it will grow the quicker; there is a piece of a fang of a tooth, I see," which Mr. Webber took away with his dressing pincers. After this Forder went away, and never returned. About a fortnight afterwards the Committee met; after which I was ordered to go down to Forder, and to tell him that the Gentlemen considered he had behaved very ill, and most ungratefully towards Mr. Webber, and also themselves, and that they should not give him the cast he had taken away without leave; he could either return it, or pay the 8s. 6d. charged for it by Mr. Harper, but he refused to do either; and he and his wife both abused Mr. Webber for having done the operation.

While Forder remained in the hospital, he always spoke of Mr. Webber in the most grateful way; and his wife told me, that "when he was informed that he was to be admitted, he raised his two arms as well as he could above his head, and clasping his hands, made a strange humming sort of a noise; at first they thought he was going to swoon away, but found that he was attempting to sing some prayer, as he was so overjoyed at the idea of getting into the hospital; where, he made them understand, he was sure he should get well."

One evening, about a week before he left the hospital, he and his wife, when she came as usual to see him, had a quarrel about some money she had collected; he got into a very great passion; and Mary Holditch (a patient) and I, heard him say very loudly to her, "I tell you it shall go to take my best trousers out of pawn; you know I have no clothes to wear; and you only wished me to come here to be operated upon, because you thought it would kill me out of the way." When Mr. Harper came, on Monday (15th July), to color the second wax cast he had made, he said something to Forder's wife, who happened to be there, about the operation, and how well her husband had done; she made some reply, which led Mr. Harper to say, when he came into the kitchen to wash his hands, that "The woman seemed to be disappointed at his getting well." Forder told me, the day after the quarrel with his wife, that he was afraid his lip was injured, as his mouth bled.

The deposition of Mr. I. O. Harper, taken before the Committee of the Norwich Free Hospital, March 6th, 1854.

I am sub-curator of the Norfolk and Norwich Hospital Museum. I was sent for by Mr. Webber on Friday July 29th, 1853, to take a cast of the face of Wm. Forder, a patient in the Norwich Free Hospital for "Incurables." It was a difficult cast to take and required great care, as the man was in such a dreadful condition, with so small an opening in his mouth, through which he was obliged to breathe, as well as take nourishment. Mr. Webber sent for me again on Saturday, August 13th, after he had operated upon him, to take another cast of his face, which I had no difficulty in doing, as the man was much stronger, the wounds all healed, and had now a good nostril through which he could breathe freely. The casts *are* in *every* respect *accurate*. I do not think anybody could have produced more faithful ones.

I, one day, said to Mr. Webber when he was up at my house, we ought, sir, to have a pair of the casts in the Museum? He said, "well! I dare say you can if you think they would like them." I said, there were none in the Museum of any case at all like it, and that I had no doubt they would be very acceptable. Mr. Webber said I might make a set, and that he would speak to the Committee of the Free Hospital about it. After a time, Mr. Webber told me that the Committee had agreed to give them to the Museum, and that they should at all times have much pleasure in sending anything from the Hospital which might be acceptable to the Museum. The casts were made; I took them up to the Museum in a proper glass case, on Thursday, October 20th, 1853; they, till then, were never out of my hands. I sent my bill to the Committee of the Free Hospital, it was paid through Mr. Webber, and I handed him a proper receipt for it. I made several other sets of casts; they were all alike; the moulds being the same I *could not* err.

END OF FORDER'S CASE.

"THE PENCIL AND THE PEN."

History of the Case pourtrayed in the Published Prints bearing the above Title.

Mary Tuck, living at Smallburgh, in this county (Norfolk,) 35 years of age, unmarried, of dark complexion, exsanguineous temperament, torpid constitution, quiet and reserved habits, and possessed of good mental capacity, states that nine years ago she first perceived a small lump in the right temple, about an inch from, and in a horizontal line with the external angle of the eye; it was then not more than three quarters of an inch long, and a quarter of an inch wide, feeling like a split almond under the skin, but somewhat soft and elastic to the touch; moveable to a certain extent, but resting apparently upon the edge of the zygoma, or "yoke bone." It continued gradually to increase for the first six years, and by that time had attained to the size of a large hen's egg. During this period she frequently consulted the late Dr. Lubbock, of this city (eminent alike for his surgical and medical skill, and not less celebrated for his professional zeal and philanthropic disposition), who from time to time prescribed (gratuitously) for her, constitutional and local measures. She did not suffer much from pain in the swelling, but often from a dull subacute form of hemicrania, particularly after exposure to cold air. Her general health was uncertain; sometimes it was tolerably good; at others, she experienced considerable annoyance from disturbance of the digestive organs.

After the premature and widely-lamented death of the highly-esteemed gentleman alluded to, she sought the advice of other medical practitioners, one of whom essayed to puncture the tumour, when a considerable quantity of brown turbid fluid, of a heterogeneous character, resembling a mixture of port wine lees, and curdy flocculi, escaped. The wound was dressed, and healed as soon as possible, but the uniform support of the hitherto ovate capsule, or investing bag of the tumour (it would seem), being destroyed, it sent forth as it filled again the upper tube-like process shown in the portrait. Two years afterwards, another surgeon, to whom she applied, also ventured to lance it; a secretion, of a like kind as on the former occasion, was discharged, larger in quantity, but of thinner consistence.

The wound did not on this occasion go on so kindly, severe constitutional disturbance supervened, and it healed slowly, eventually giving rise, as in the previous instance, to the production of another process of like feature, and forming the bifurcation represented in the plates; a sequel which might, I apprehend, have been expected to occur, for the reason I have surmised, (the skin standing sponsor *pro tempore* for the future investment,) upon each successive puncturation. The growth of the tumour became much more rapid after being thus treated.

The patient, having learnt that I had lately returned to the county to practice, and had come to reside here, came on the 28th of December last, to consult me about her health—but she did not mention the tumour, which I discovered by mere accident, so dexterously had she contrived to hide it, by wearing a drawn bonnet flattened at the top and spread out at the sides, which were brought forward so as to project beyond the profile of the face, and lined with a black crape cap, frilled into big puffs, aided by a large lock of false hair, which was made to encroach far upon the cheek.

As she, about to leave the room, turned into a stronger light, I observed the protrusion of the before shaded right eye half covered by the hair referred to; this led to the disclosure of the tumour (shewn in the wood-cut below,) and I am free to

confess that never was I more astonished than at beholding the extraordinary concealment, which (considering the magnitude of the swelling, its projection exceeding more than four inches and three quarters) she had succeeded in achieving. Her reason for not mentioning it, she said, was, that she had been assured that "nothing more could be done for that, and that she must make up her mind to meet the certain consequences of it." After examining it attentively, hearing its history; the slowness of its growth; the absence of acute or lancinating pains; the comparatively slight constitutional disturbance she had to contend with; the original shape of the tumour; the non-occurrence of fungoid sproutings after the punctures; the healthy state of the glands and adjacent structures; and, looking to the situation of it; the countenance of the patient, in which I could perceive no unpropitious indication; and other circumstances, I became assured that the disease was *not* of a *malignant* kind, but a simple encysted tumour of the wen species, and that it might be safely cut out.

Although it lay in close juxtaposition to the cheek bone, I could yet discover that it had no attachment to it, nor to the zygoma, both of which were however much driven out, and as I conceived, partly absorbed, as they yielded to firm pressure. I could also, by placing my fingers closely above and below at the base of the mass, raise it sufficiently to convince myself that the temporal bone was also very thin, for I could readily distinguish the pulsatile influence of the brain through it.

Jan. 17th. The patient, who had now paid me a second visit, did not disclose that she had taken more than three or four other opinions about her case, nor was it till nearly a fortnight after the operation which will be described, that I became acquainted with the fact, that she, prior to my seeing her, had had the opinions of six Physicians and ten Surgeons or general practitioners,* "none of whom had advised her to submit to the removal of the disease, conceiving such a step, she was satisfied from what they said, to be very perilous, and she herself felt

*It has been suggested by two or three gentlemen, (not members of the profession) that the names of the practitioners who had been consulted should be mentioned; but this I have omitted to do, as such a statement could serve no good end, and otherwise is not consonant with *my* feelings or purpose; my object in publishing the case, being simply to show the *distinctive* difference between *mild* and *malignant* disease; to point out that the discrepancy of opinion in this case is additional evidence of the benefit which science, and consequently the public, would derive from the more friendly, and frequent intercourse and cordial co-operation of medical men with each other, and how incompatible are their jealousies and discords with both their own interests, and the security of the lives of those committed to their trust.

quite certain that it would soon kill her if it were done." I told her that the only *certainty* I could see in it, and which I could but point out to her was, that if she did not have it removed soon, it would shortly remove her; that it was not a matter of choice therefore, but a matter of duty in her to have it taken out, and which, I believe, could be safely effected, and with such impression I could not but urge her to have it extirpated. At length, finding her determined not to adopt my recommendation, I wrote the following note to her uncle, with whom she was living, and by whom she had been brought up from a very early period of her life.

St. Giles', Norwich, January 17th, 1851.

MR. HOWES,

You are, I believe, aware that your niece, has twice been here to consult me. I have deliberately examined the tumour upon her head, and I am firmly of opinion that it might *now* be completely and *safely* removed. I can perceive nothing malignant in its nature; it is, however, *unquestionably* FAST increasing, and if suffered to go on, will *soon* involve very important structures at *present* unaffected; and be productive of the most serious and painful consequences. Its removal, under *such* circumstances, would probably be not only hazardous, but I fear, unaccomplishable. I feel persuaded that, not only could I take it out safely, and without much pain to her, but that the wounds would, in fourteen or fifteen days, be cicatrized (healed) leaving scarcely any scar perceptible to ordinary view. As she has stated that her means are very scanty, I have offered to do the operation free of charge, as I have often felt it to be my duty to do for others similarly situated. Having thus placed the matter openly before you both, I leave you to decide as to the future among yourselves.

I am, yours,

WM. WEBBER.

P.S. Your niece will return to-morrow, to talk over the subject of this note with you.

On the Wednesday following, January 22nd, the patient came to inform me that her friends as well as herself were averse to any further operation being done. During my remonstrance with her, as to so unwise a decision, she said, "that the late Mr. Crosse had twice seen her, and had written a strong opinion upon her case, in which he said that it was impracticable both as regarding the attempt and the propriety of its removal by the knife, as it was a disease of a malignant sort, and they meant to abide by his advice; besides which, the other medical

gentlemen were all of the same opinion." I quietly reminded her, that I could not help what they might have said; that they were not here to answer for themselves; and that I was responsible only for what I had said or might do.

Feeling strongly upon the case, and believing that I could be the means of freeing her from her destroying malady; and finding that she and her friends were determinedly opposed to my making the attempt, as she was quitting the room I thought it right to place the matter thus before her—"You know that you must die, as it is, and ere long too, if the disease be not got rid of; it will work its way to the brain, or it will burst, and then a fungus will most likely sprout forth, entailing upon you much suffering, and a miserable wearing out of your powers of life. The operation affords you a good chance of the extension of your life for many years, and most probably, good health withal. Trials are placed upon us in this world not only for our present welfare, but always, I believe, for our future benefit; and I can see no difference in the moral guilt of one person, who would permit a tumour to destroy her, and that of another person, who to rid herself of the weight of some mental disquiet, puts an end to existence by the application of a knife, or rope, to the throat. I have felt it to be my duty to say thus much to you, and now I shall leave you to act as you think proper."

After a long pause, she (evidently struggling with her fears, and moved by deep reflection of which she is very capable) said "Sir, your argument I cannot resist; you must, if you please, do by me as you would be done unto." This being settled, the next thing was to procure lodgings, and here her small means and the fears of parties (who seemed to be *well* acquainted with the case; at which, for *the moment*, I was surprised) that she would die in their apartments, offering great difficulties, I had a room fitted up in my own house, in which she was speedily domiciled. Having put her general health into tolerably good order, and her mind having become comparatively comfortable, I proceeded, (giving the patient only a few minutes notice,) on the 25th of January, to remove the tumour, aided only by the valuable assistance of my friend Mr. Spencer Freeman, of Stowmarket, to whom I shall leave the description of the operation, and its gratifying results.

March, 1851. W. W.

"THE PENCIL AND THE PEN."

DESCRIPTIVE ACCOUNT

OF THE

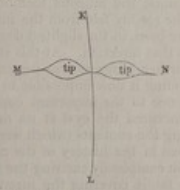
OPERATION PERFORMED UPON MARY TUCK,

On the 25th of January, 1851.

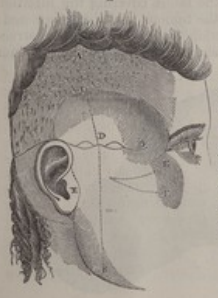
Early on the morning of the 25th of January, I was sent for to Norwich to assist my friend and early instructor, Mr. Webber, in the operation he was about to perform upon Mary Tuck (whom I had till then never seen,) in the propriety of which I concurred, without hesitation; not more perhaps from my own conviction of the non-malignant features of the disease, and the practicability of its removal by the knife, than from the knowledge I possessed of my friend's long professional experience, his sound judgment, and well-known skill and dexterity as an operator.

The preliminaries being quickly arranged, the patient was seated in a reclining chair, and her head supported on the bosom of an experienced and well-instructed nurse. The operator had not effected more than an inch of the first incision when the patient's resolution forsook her; she sprung from the chair, declaring her inability to bear the severe trial, and protesting against any further procedures. For a long while I thought all chance of getting her to undergo any further operation was at an end; but the untiring perseverance of the operator was not to be defeated, and at length chloroform (the employment of which she had previously resisted) was, by the exercise of admirable tact, made to act upon her sufficiently to quiet her in a great degree (although not sufficiently so to deprive her of consciousness,) and my friend resumed his formidable

task with the utmost self-possession and steadiness; extending the first incision (which he had commenced about an inch and a half below the sagittal suture, as shown at A, fig. 3,) over the centre of the tumour, between the bifurcation down to within half an inch of the angle of the lower jaw B, he intersected it by another, beginning about two inches behind the ear, and above the root of the mastoid process, C; carrying it in a horizontal line, traversing in its course the ends of the bifurcation, but excluding the very thin skin upon the extreme points of it (*see fig. 2, tips,*) and ending half an inch from the angle of the eye D. He then cautiously dissected off, and reflected the four flaps of integument (the most attenuated I ever saw; too thin, I feared at the time, to maintain their vitality) turning the ear back, upon the upper part of the neck. The tumour being thus denuded, he proceeded to detach it from the temporal ridge and fossa; removing, unavoidably, a great portion of the fibres of the temporal muscle, which were spread over and blended

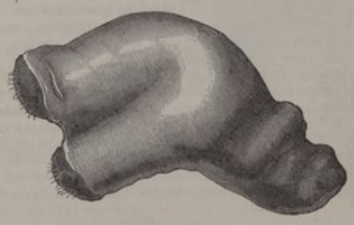


The lines of incisions: the first beginning at K, *carried down to* L; *the other commencing at* M, *carried round the tips of the bifurcation, and finishing at* N.



Showing the circatrization on the 19th day after operation. A, B, C, *dotted lines, exhibiting the wounds so closely united as to be scarcely perceptible.* D D *the new formed skin, in place of that left on tips of tumour, which was too thin to save.* E E E E *thin portions of zygoma remaining, partially absorbed.*

with the capsule; pursuing the separation downwards, he exposed the parotid gland and its duct, which he defended from injury by the interposition of his finger. The zygoma was shown, as had been anticipated, to be in a great part absorbed, and its thin remnants spread out. The next step was extirpating the portion dipping into the orbit; this he readily accomplished, by dissecting it from the eyeball and its appendages, which were pushed forwards for the moment, to give room, and to guard them from damage; and to which the tumour was attached by mere cellular tissue, evidencing that its incursion in that direction was of more recent date. This being done, he was proceeding to separate the part in close contiguity to the cheek-bone, when he discovered that the bone was not only excavated by absorption (which it was clear had been going on for some time) and projected outwards from the pressure of the swelling, but that the growth extended down deeply behind it, under the floor of the orbit, towards the pterygoid fossa; filling also the antrum, and pressing against the mucous membrane of the mouth; although it could be readily felt from the inside of the mouth, the patient had never been, in the slightest degree, inconvenienced by its projection in that direction. At this stage of the operation, an obstacle to further progress was presented by the tensely distended sac; finding it now impossible to use his finger as a guide and as a defence to the important contiguous structures, Mr. Webber punctured the cyst at its neck, formed by the *os malæ*, and receiving the contents (which were of the same character as was described in the history of the case) into a sponge, speedily succeeded in completely excising the sac, which was firmly adherent to the fascia covering the insertion of the temporal muscle, where the tumour probably originated; the capsule, as we remarked, exhibiting a similar fibrous structure. (The wood-cut here shewn, represents the tumour removed.)



A frightful cavity now presented itself, bounded above by the floor of the orbit, and the partly denuded ramus of the jaw below by the masseter and buccinator muscles, and mucous lining of the mouth pushed out of their natural positions. Behind, by the pterygoid fossa and mucous membrane, and in front by the anterior wall of the antrum, the parotid duct, driven from its course, lay unscathed at the bottom of the vortex.

It is not easy to conceive a more appalling sight than now presented. Contrasted with the pallor of the patient (although not more than four ounces of blood had been lost in the operation), the turned back flaps discovered a vast red surface, and a large deep cavity; looking, when viewed laterally, as if one side of the head had been scooped out. Several vessels were necessarily divided in the course of the dissection; the temporal, transversalis facici, and posterior auricular were of larger size than usual; but instead of tying these and two or three other arteries of a similar calibre, the operator contented himself with pinching their open mouths, and exposing them to the action of the air; an expedient, which in this, as in several other cases in which I have seen him adopt it, answered perfectly—no secondary hœmorrhage occurring. A main advantage where vessels are deep seated or in cavities, as in the case of the successful extirpation of the *puerperal* uterus, first performed by Mr. Webber, at Yarmouth, in 1827.

The whole surface having been carefully sponged, was exposed to the action of the air for 12 or 15 minutes; the points of the four flaps were then brought together, and kept, as were also the edges of the incisions, in close approximation by sutures and straps of plaster; the parts supported by graduated compresses of lint, and the whole secured by the simple bandage, known as "the Poor Man's Nightcap." The patient was now placed in bed; all motion of the parts by talking or otherwise was prohibited, and she was strictly enjoined to take nothing but liquid food, and that through the spout of a teapot. On the Tuesday following (the 28th,) I was present at the dressing of the wound; the patient was cheerful; she had not had a single unpleasant symptom, and, as she assured me, had suffered scarcely any uneasiness. On removing the dressings, the wounds were found to be united throughout, except the portions corresponding with the excised skin left on the points of the bifurcations (marked D.D. in Plate 2, Fig 3.) and which could not be got to meet in the first dressing; a coagulum filled the cavity in the cheek, which was gradually supplanted by healthy granulations, and on the 19th day after the operation, the cicatrization was complete, the patient having been able to walk out in the garden occasionally from the 12th day.

On visiting Norwich six weeks after the operation, I found the patient still domiciled at Mr. Webber's, he having been induced, as he informed me, to destroy the first cicatrization by drawing a fine lunar caustic over it, in order to afford the parts a better chance of filling out, and to prevent constriction arising from adhesion of the edges to the temporal muscle, which probably would have inconveniently limited its action, a measure which beautifully answered. The patient is now quite well, with a stronger state of health than she has possessed for many years; and scarcely a scar remains visible to even close inspection.

A more gratifying case cannot, I apprehend, have fallen to the lot of any surgeon; and I am, therefore, the more surprised to hear it now reported, that instead of its being a formidable undertaking, skilfully accomplished, "it was a desperate operation, rashly, nay recklessly done, in opposition to, and in the face of, the previously expressed opinions of the physicians and general practitioners (many of them connected with the public hospitals,) who had seen the case." I, of course, did not hesitate to tell Mr. Webber what I had heard, and I am not aware that I can offer a more complete answer to such absurd, and untenable insinuations, than is contained in the reply Mr. Webber made me. "Oh, let them say what they like; you must regard all these *remarks* as the outpourings of envy, malice, and disappointment. They

have outwitted any sense they may possess by their censorious and eager efforts to injure me. Short-sighted simpletons! they do not consider that they are proclaiming their own ignorance of the nature of the case, and their incompetency, while they are misrepresenting the grounds of my success," and I may add, as they well knew and *had* signified to the patient, she must have soon fallen a victim to the disease, had the operation not been performed; but judicious "help" has thus been shown to be far preferable to useless "pity," and a happy "*Finis coronat opus.*"

S. F.

Stowmarket, April, 1851.

The deposition of Margaret Phillips, taken before the Committee of the Norwich Free Hospital for Incurables, March 6th, 1854.

I am a nurse. Mary Tuck has twice been staying at my house. She had a tumour on the right side of her head, which she told me had been growing many years. She consulted Mr. Gibson, and he lanced the swelling, at my house, sometime before the Michaelmas of 1849. It discharged a great deal of odd-looking stuff, for a fortnight, or three weeks, and her health suffered a good deal. Soon as it was healed she went home, and I saw no more of her for twelve months; she then came back; that is, about the October, or November of 1850. She again consulted Mr. Gibson, who was attending some patients in my house. I was his nurse. He examined the tumour, which had in the interval, since he punctured it, become much larger, and sent out another hornlike-looking projection like the first. Tuck said she came to have it taken out. Mr. Gibson declined to do it. She afterwards told me that she had been to Mr. Webber (who I had not then heard of as living in Norwich), and that *he* said he *could* remove it. I said, "If Mr. Webber can do it Mr. Gibson can." I took an opportunity of mentioning to him what Tuck had told me; and I asked him whether it *could* be done. He said "*No;* let her go home, her health is very bad." I advised her to return to her friends. She saw Mr. Webber again; and after that she told me Mr. Webber had written a note to her uncle, as he *was sure* it *could* be done *safely*. She then went home. I afterwards heard that she had come back to Norwich, and that Mr. Webber had succeeded in removing it, and that she was well, which, from what I had seen of it, I could not have believed; especially after Mr. Gibson had said that *no one* could operate safely on it, or take it away. I have seen and nursed a great many bad cases for Dr. Lubbock and other medical gentlemen, but I never saw such a wonderful recovery as that of Mary Tuck. I have seen her lately for the first time since she left my house, in 1850. She was in perfect health, and scarcely the slightest scar to be seen, and that only by turning back her hair and looking closely. I have seen the drawings of her case; nothing can be more correct, except that the tumour seemed to be bigger, and to stick out further than the drawing of it represents.

THE MORTALITY

AFTER

OPERATIONS OF AMPUTATION

OF THE EXTREMITIES,

AND THE CAUSES OF THAT MORTALITY.

BY ARTHUR ERNEST SANSOM,

ASSOCIATE OF KING'S COLLEGE.

The Prize Essay of the Medical Society of King's College, London,

FOR THE YEAR 1858.

Je veux—j'essayerai.

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TO HENRY LEE., ESQ., F.R.C.S., PRESIDENT,
THE VICE-PRESIDENTS AND MEMBERS OF THE
MEDICAL SOCIETY OF KING'S
COLLEGE, LONDON.

GENTLEMEN,

BEFORE you, to whom it was originally due, I lay this Essay in its present form. The encouragement and assistance that I received on the evening on which I read it before you determined me to endeavour to render it less incomplete than it was then.

Especially I have to thank Mr. Henry Lee for aid and advice, and Mr. George Lawson for the statistics with which he furnished me.

To others interested in this matter a few words of explanation concerning the subject, and apology concerning the author, are due. The Essay was originally written to compete for a Prize, the title having been chosen by the Dean of the Medical Department of King's College (Dr. Guy). Much has been added to it since. I have dared to differ in these pages from some high authorities; but I was convinced that the subject is very important, especially at the present time; and that, at least, an accumulation of data might facilitate the labours of more competent observers than my-

self. These are my excuses for my hardihood in publishing. There may be, too, something beneficial in truth being sought by one so young in the Professiona, untramelled by prejudice. I can easily conceive that, in the labours of the learned on this subject, pet theories may creep in—mingling even with STATISTICS,—though a would-be-vigilant watcher be over them. If I have erred it has not been thus. "Nihil est mihi veritatis luce dulcius."

THE AUTHOR.

CONTENTS.

	PAGE.
Historical Introduction	1
Mortality after Amputation in late years	5
Mortality in London compared with that in the Provinces	7
Amputations compared with Excisions	7
Comparative Mortality after Amputations of the Several Members	8
Amputation at the Hip Joint	9
Primary, Intermediary, and Secondary Amputations	10
Amputations for Disease	10
Influence of Anæsthesia on results of Amputation	12
Amputation by Rectangular Flap	18
Average Periods of Recovery and Death	19
Immediate Causes of Death	20
External Circumstances favouring Recovery or Death	22

ON THE MORTALITY AFTER THE OPERATIONS OF AMPUTATION OF THE EXTREMITIES; AND ON THE CAUSES OF THAT MORTALITY.

Not only at the outset of an enquiry of this sort does it strike one as a difficult task lying before one—the assignment of true causes, the careful sifting of the apparent from the real, the explanation of discrepances, in that spirit of caution necessary to those who are investigating the fore-ordained, complex influences which rule over human life—but the difficulty is increased at every farther step, for each becomes a yet new point of view, and discloses a yet wider field. I cannot hope to fulfil this task completely—the enquiry is not to be fully made by one man. It is only by accumulated experience, by careful record of observed facts, that deductions can be made; and theories from these have to be well weighed and have to pass through the sieve of many impartial minds. The portion of task that I allot myself is—to collect what I am able to do of the results obtained by men who, in various phases, have investigated this subject, or parts of this subject, before; and to strive myself to deduce somewhat from records I have been able to obtain. It is scarcely possible to divide the one part of this subject from the other; the general plan, then, to be adopted in these pages, is a clinical plan—such an one as he would adopt who would pass from step to step. First, the general subject of the rate of mortality will be undertaken; and subsequently the various special points which the general enquiry has suggested.

I.

Amputation, "the opprobrium of surgery," has ever been considered an operation not rashly to be performed—in early times one scarcely to be undertaken at all. We can well imagine how

the ancients, without sensible means of controlling hæmorrhage, and with an inrooted dread of its occurrence, shrank from an operation where bloodshed was so great. Accordingly, in the infancy of surgery, it was never performed. In the age of Hippocrates, whose, creed yet was, "Physic!—the Knife!—Fire!" the operation seems to have been confined to the removal of mortified parts. It was not until Celsus that there was any improvement; he extended slightly the list of circumstances under which the operation should be undertaken, and he distinctly specifies in his work a method of arresting hæmorrhage by ligatures on the bleeding artery. After him was an age of "Cimmerian gloom." We can easily realise how fatal the operation was then, and glory that we in this age neither are subject to the use of, nor employ, the red-hot knife, nor other potential-indeed, cautery.

Guido di Cauliaco (Gallice Guy de Chauliac), humanely encased the member whose removal was desired, in pitch-plaster, and, applying a tight band, allowed it to mortify off spontaneously. The invention of gunpowder, though it gave more opportunities for amputation, caused no improvement in our ancestors' practice, until came Ambrose Paré — thanks to him for the abandonment of the disgraceful styptics and caustics, and the adoption of Celsus' idea of ligature of bleeding arteries! Yet, of course, time elapsed before the ancient system was discontinued. In the middle of the 17th century, rose our own Wiseman. Amputation was divested by him of many of its terrors, and the mortality after it was lessened. In military practice he enforced primary (immediate) amputation, and surgeons began to disbelieve in the *peculiar* venom hitherto supposed to have existed in powder and ball. The essential steps of the operation now were (1) the application of a ligature around the limb about two inches above the point at which it was desired to amputate (2), drawing up the muscles and incising as far as the bone with a large curved knife, with the back of which the periosteum was scraped off, (3) the sawing through the bone and ligature of the arteries after the manner of Paré. After the operation, the cut muscles were drawn over the bone and fastened by stitches or bandage. Still, the wound was dressed with styptics. The circumstances adverse to the success of the operation now were (1) the size of the wound (so large a part of the stump being without a fleshy covering), and the consequent long and profuse suppuration, (2) the slowness of the stump to heal, (3) the exhaustion attendant, the ends of the bones being left projecting. About 1679, the idea of a flap occurred to Mr. Lowdham, of Exeter, and was put in practice by his brother, Mr. Yonge—its formation, its being adapted over the face of the stump and sewn by four or five stitches (in fact nearly as the operation is at present done) is described by the latter.

The next improvement was the use of the tourniquet in the operation. It now began quickly to assimilate that of our own day. Petit abolished the large crooked knives, and invented those of less terrific form now in use; yet Petit put too much confidence in pressure instead of ligature. Now were established the two ways of performing amputation—the circular method, *i.e.* the old operation, modified from time to time—and the newly-introduced flap. The former was practised and improved by Alanson; the latter received many improvements at the hands of Hey, Chopart, Dupuytren, Larrey, Lisfranc, and Liston.

Such then is a brief—not, history of amputation—but historical resumé of the most special circumstances affecting the increase or decrease of the rate of mortality after the operation.

We now come to the investigation of the question—What has been the fatality of the operation in late years? On this point, the results of observers are very conflicting; some, as I shall presently tell you, argue that the rate of mortality after the operation, has been increasing; others hold that it has been diminishing. To establish arguments on this question from statistics, we must, I think, allow one or two axioms. We must not expect absolute exactitude in our tables and judge that a solitary result will establish a truth. But when we take similar fields of observation, and periods of time nearly similar in their duration, our results at any rate establish a high degree of probability. The following tables have been compiled partly from Mr. Guthrie's commentaries, partly from the records of the London Medical Society of Observation, which, through the kindness of Mr. Henry Lee, I have been enabled to consult; and partly from the records, so valuable because so circumstantial, of individual operations, published periodically in the "Medical Times and Gazette." I must say a word or two as to the manner in which the results in the latter case were arrived at. Before I had finished the compilation from the papers, Mr. Teale, of Leeds, in his work on Amputation, came to my aid. From this latter I obtained the result of thigh and leg amputations, to which, each year, I added those of the upper extremity, obtained from the "Medical Times." From his results, Mr. Teale strikes out the cases which are "under treatment." I cannot consider this quite just; the error, whether they be retained or ignored, will certainly be small; but the probability, I think, is far greater that these have recovered than that they have been unsuccessful. Especially for this reason: that one sees recorded in the "Medical Times" report, occasionally, that the case "So and So reported as under treatment has died." Evidently a supervision has been exercised over these cases.

In these tables the cases "under treatment," unless other-

wise indicated, have been added to the list of recoveries. The proportion of "cases under treatment," to the whole number of amputations, is about one in thirteen: so anyone differing from me in my opinion as to the favourable issue of these, may, with ease and very near correctness, alter my results. This must not be done in the case of the operations from 1837 to 1842, for in those records every case is given with its absolute result. Concerning these tables I shall have more to say under the head of Anæsthesia. The results of amputation during the latter part of the Crimean war, were shown me by Mr. Lawson.

TABLE I.

Mortality in Military Practice.

	Mortality, per cent.
Army in Spain, both in hospital & field (principal amputations only)	44
Army in Crimea during the late Russian War (all amputations)	27·3

TABLE II.

During the Great Paris Insurrection.

Hospital.	No. of Operations.	Deaths.	Per Cent.
La Charité ..	26	10	38
St. Louis	12	7	58
	52	20	38
Hotel Dieu ..	15	9	68
Various others	79	50	63
Average			52

TABLE III.

In London: 1837 *to* 1857.

Period, &c.	No. of Operations.	Deaths.	Per Cent.
1837-1842	184	69	32·95
1840.....	87	32	36·07
1854.....	180	56	31·11
1855.....	136	35	25·75
1856.....	155	43	27·74
First six months of 1857	84	19	22·61
Jan., 1854, to June, 1857	555	153	27·05

These tables show that in time of war we must expect to lose nearly half the number of those soldiers whose wounds have necessitated amputation, and that in our own hospital practice, about one out of three cases. I shall again allude to these points at a future stage.

Is the operation of amputation, *cæteris paribus*, followed by a greater rate of mortality than other capital operations? According to the following table, it would appear that the operation for the cure of strangulated hernia is more fatal than amputation, while the latter is attended with much greater mortality than lithotomy.

TABLE IV.

Comparative Mortality after Capital Operations. Mortality in London Compared with that in the Provinces.

		Amputation.	Lithotomy.	Herniotomy.
London Practice,	1837-42	31·7	...	50
„ „	1856	27·74	26·6	47·78
Provincial „	„	26·15	12·34	27·17

One cannot fail here to be struck with the decided success of the Provincial over the London practice. No doubt this cannot be taken as the absolute expression of the value of the former above the latter, but its comparative success is beyond a doubt. According to Mr. Teale, it would be about one and a half per cent. more favourable in the case of amputation of the thigh and leg.

The cases coming under the treatment of London surgeons are, most probably, those of patients more debilitated than such as require amputation in the country. But this seems not to be all—the depressing atmosphere of a London hospital must have its share. This is full of significance. How desirable it would be to have a hospital for patients requiring formidable operations within an easy distance of London, with the advantage of London skill, and with the no less important advantage of country air!

Concerning the relations between amputations and EXCISIONS, a careful enquiry made by Mr. Thornton, whose observations embraced 1154 cases occurring in the army service, shows that excisions are more favourable by three per cent. (see "Ranking's Abstract," vol. xxv. p. 150). I imagined, *à priori*, that this, as a general average, must be too low, for cases of excision are less favourable in military practice than in civil. Statistics bear out my hypothesis. In 1855, 1856, and the first half of 1857, there have been performed 69 excisions of the principal joints—the deaths have been 13—thus making a mortality of 18·84 per cent. Compare this with the mortality after amputation; it is about half as favourable again. Citing the cases of individual joints, Mr. Thornton states that excisions of the shoulder are 15 per cent. better than amputations, and, of the elbow, 7·19 per cent.

It would, on first thought, appear probable that the mortality

after the removal of the lower extremity—the greater mass—should be greater than that after amputation of the upper extremity; and so it is—but the mortality after the removal of the several parts varies considerably.

TABLE V.—A.

*Comparative Mortality after Amputation of the Several Members.**

	* Military.	Ditto, Mr. Thornton.	1846.	1846. London	1846. Provincial.	Average
Shoulder Joint....	46	31·66	..	..	..	38·88
Arm.....	34	..	23·8	21·4	16·1	23·8
Forearm						
Thigh	52	..	40·7	28·3	30	33 | 41·1
Leg			41	33·3	30	34 |

According to these results the mortality after removal of the upper extremities is somewhat more than half as great as amputation of the lower. Amputation of the forearm seems to be about half as fatal as amputation of the upper arm. In a table given in the late Mr. Guthrie's work, (p. 154)—a table which, however, can only be taken as an approximation to the truth, since cases discharged elsewhere are counted as successful, and many cases are excluded—the mortality in the former case is to that in the latter as 25 to 9.

I am much indebted to Mr. George Lawson for the results of the amputations during the latter part of the Crimean war, with which he has furnished me. I append them in a separate table.

TABLE V.—B.

Mortality during the latter half of the Crimean Campaign.

	No. of Operations.	Deaths.	Per Cent.
Hip	7	7	100·0
Thigh { upper third....	38	31	86·8
Thigh { middle.....	56	31	55·3
Thigh { lower	4	23	50·0
Leg	89	28	30·3
Ankle-joint	9	2	22·2
Medio-Tarsus.....	7	1	14·2

* Calculated from the late Mr. Guthrie's Commentaries, pp. 151, 152. It includes the operations in the Spanish campaign between 21st of June and 24th of December, 1813, both in Hospital and on the field. Cases "under treatment" have been deducted.

The results in the third column, as Mr. Lawson has pointed out, strangely show how the mortality was dependent on the amount of limb removed. But that this is not the general rule is seen by Table V. A, wherein the mortality after leg amputations in one case is equal with, and in some cases exceeds, that after thigh amputations.

Scattered throughout the items of general medical information in the medical papers, we often see an account of isolated successful cases of amputation at the *hip-joint*. The danger is, that amid this blazon of success the admonitory voice of failures should be unheeded. Mr. Thornton, before quoted, states, that, of 10 amputations observed by him, all were fatal. So also were all those recorded during the Crimean war, (Table V., B.) M. Heyfelder, (Gaz. Med. de Paris, Nov. 3rd, 1854) performed the operation five times, with success in three instances. To refer to older authorities, Cooper says:—"A calculation has been made that the proportion of recoveries has been six in twenty operations. At all events, it appears that, in the course of ten years, nearly twenty well-authenticated instances of recovery after this severe operation have occurred." The operation has been scarcely more successful of late years; primary amputations seem to be almost all unsuccessful.* Mr. Thornton's cases were probably all primary. I have records of primary operations by Mr. Erichsen and Dr. Beatson, still unsuccessful—the former operated on a thigh crushed by a cart-wheel: the patient died from shock; the latter for a gun-shot wound in the left hip by which the neck of the femur was completely comminuted. In this case also the patient died of shock; whilst, on the other hand, M. Heyfelder's operations were all for disease. One case of primary amputation was successfully performed by Mr. Humphreys, of Addenbrooke's Hospital, at Cambridge. The case was a compound fracture of the thigh by a waggon-wheel; no fewer than 43 ligatures were applied. Another case of amputation for *disease* was performed by this gentleman with success; it was for epithelial cancer, the size of a cheese-plate, on the outer side of the left thigh. Another example of success in a pathological amputation of the hip is recorded by M. Hénot, of Metz; the operation was undertaken on account of a large exostosis.

II.

Pursuing now the clinical way in which I proposed to consider this subject, let us suppose that we are debating as to the propriety of an amputation on our unfortunate patient. The first

* Blandin and Larrey had one successful case each out of three and seven.

question to be considered is, whether injury or disease is supposed to necessitate the operation. We thus divide amputations into two great classes—amputations for injuries and amputations for disease. The former are nearly twice as fatal as the latter. Operations for injury are capable of further sub-division according to the period of their performance. After an accident a previously healthy man will suffer at first no more than the effect (primary) of that accident on his nervous system; there is no change in the appearance of the wounds. After a day or two the seat of injury will have become acutely inflamed, fever will be induced, suppuration will occur. Still uninterfered with, the suppuration continues, sloughing probably occurs, and hectic fever—meanwhile, the patient is wasting—sets in. The first period, then, is the period of nervous tension; amputation done during this time is called *primary*—the second is the period of inflammatory fever. Amputation now done is called intermediary. The third, the period of hectic, is that of secondary amputation. This is Mr. Alcock's division, but hitherto, primary and secondary operations only have been recognized—the latter having been defined by Mr. Guthrie as "Amputations after the lapse of six or more weeks; when suppuration is fully established." There has been much discrepancy of opinion as to the comparative success of operations done at these two periods. The authority last quoted says that primary operations have a great advantage. "In the secondary period after injuries, the areolar and muscular textures near the part injured are often unhealthy: the bones are in many instances inflamed internally, and their periosteal membranes deposit on the surrounding parts so much new ossific matter as frequently to envelope in a few days the ligatures on the vessels and render them immoveable, necrosis of the extremity of the bone following as a necessary consequence, and protracting the case for months."

Mr. Guthrie's assertion is fully borne out by the events of the Crimean war. Of 690 primary amputations 175 were fatal—viz., 25·3 per cent: whilst of 89 secondary amputations, 38 were fatal, representing a mortality of 42·7 per cent.

The great cause of death after these operations is the impression on the nervous system. Either the impression is such that the patient never rallies—he dies of *shock* within 24 or 36 hours; or he lingers, sinking gradually during several days; dies of *exhaustion*. This, however, is not the sole cause; patients often die of those more lingering affections presently to be discussed.

But our patient is afflicted not suddenly by the wheel or the cannon-ball, but, Philoctetes-like, *νόσῳ διαζόρῳ*. The cases most frequently necessitating amputation are those of *diseased joints*.

These have been, happily, as may be seen by the following table, of late years comparatively little fatal. Mr. Hussey says of 164 cases observed by him in the Radcliffe Infirmary, Oxford, 91 were for diseases of joints. Of 55 of these in the thigh, ten were fatal; 6 died from the effects of the operation, and 4 did not recover sufficiently to be sent home. Of 20 in the leg, one died; of 6 in the upper arm and 10 in the forearm, all recovered. The mortality, he says, is not affected by the duration of the disease, nor by the extent of disorganization of the joint. The table (VI.) has been compiled by myself from the records of single operations published from time to time in the "Medical Times." The observations extend over the whole of 1856, and the first six months of 1857. I have only here recorded the more ordinary affections for which amputation was performed; but hope I have omitted nothing of interest:—

TABLE VI.

Mortality after Amputations for Injuries and Special Diseases.

Seat. Nature of Disease, &c.	No.	Recoveries.	Deaths.	Causes of Death.
THIGH.				
Diseased Knee Joint....	54	45	9	Pyæmia, 5 Collapse, 2 Exhaustion, 1 Tetanus, 1
Primary Amputation ..	15	6	9	Exhaustion, 4 Pyæmia, 3 Shock, 2
Sloughing after Phlegmon (Of 3 operations for gangrene, all were successful.)	2	2	0	
LEG.				
Diseased Ankle-Joint & Diseased Bones.....	19	17	2	Exhaustion, 2
Primary Amputations ..	16	11	5	Pyæmia, 4 Exhaustion, 1
Phlegmonous Erysip. ..	3	1	2	Exhaustion, 2
UPPER EXTREMITY.				
Diseased Bones and Joints	13	13	0	
Primary Amputations ..	21	18	3	Shock, 1 Pyæmia, 2
Secondary „ ..	2	1	1	Exhaustion, 1
Phlegmonous Erysip. ..	3	0	3	Shock, 2 Exhaustion, 1

An interesting comparison may be made between this table and the following.

TABLE VI.—B.

Mortality during 1837-42.

Injury or Disease.	Upper Extremity.		Thigh.		Leg.	
	No.	Deaths.	No.	Deaths.	No.	Deaths.
Injury	10	2	4	3	8	4
Compound Fracture...	10	3	8	4	20	6
Diseased bones and joints	17	4	41	12	29	13
Mortification	9	3	5	3	9	3

From this it appears that the operation during the years mentioned was attended with great fatality in the cases of diseased bones and joints; whilst the former table would lead to the supposition that in late years the hazard in these cases has been remarkably diminished. This will engage our serious attention at a future stage. I would here call attention to the great rate of mortality attendant on the operation in the case of Phlegmonous Erysipelas. In all the records I have consulted, I have only seen account of one or two cases successful. Amputation seems to be much more successful when the disease has proceeded to sloughing.

Having now considered the nature of the injury which our patient has suffered, or the disease of which he has been the subject, and having had due regard to his general condition, that his physical powers are great enough to combat with this severe operation, we come to the performance of the operation itself. But first comes the question of

ANÆSTHESIA.—When we are possessed of an agent capable of rendering our patient wholly insensible to the pain of this formidable operation, and apparently exerting no ulterior ill-effect on his system, it seems strange that we should hesitate to avail ourselves of it. We have such an agent in chloroform. And it would seem probable that since its introduction, when the operation ceased to influence the sentient part of the nervous system, when the patient debilitated may-be, or having acute sensibilities, was brought to the level of the robust and plethoric, the mortality after it should be lessened. Accordingly, after the anæsthetic had been tried for some time, Dr. Simpson published some tables whereby it was shown that whilst the average mortality before etherization was 29 per cent., it fell to 23 per cent. after its introduction. Dr. Snow, too, published other statistics, wherein, however, he made the general mortality after anæsthesia higher—viz., 27per cent.—still an evidence of the value of chloroform. Few would be inclined to call in question results which so well

harmonized with their foregone conclusions and their sympathies. But in the "Medical Times," of October 25th, and November 1st, 1856, Dr. Arnott published a paper wherein he (1) declared that the mortality after amputation had increased since the introduction of chloroform, and (2) attributed that increase to the influence of the anæsthetic. He argued against Dr. Simpson's tables, in that they contained observations spread over unequal times in different hospitals, and in their not giving the character of the cases—and against Dr. Snow's, because they were met with in private practice, and he deemed that there was selection in the cases. The mortality before etherization in certain London hospitals—viz., University College, St. Thomas's, and Bartholomew's—(equal periods of observation being taken) Dr. Arnott states to be 20 per cent.—whilst after its introduction—viz., from July, 1853, to June, 1856—it was 34·4. Whilst before etherization the total number of cases observed was 174, afterwards it was 430. In the Provincial hospitals, the mortality formerly was 15 per cent.—the average in 2 years and 9 months, from November 1856, 30 in 100.

In the case of army practice, Dr. Arnott's views are supported by Dr. Gordon (in a report read before the Crimean Medical Society), and by Dr. Mowatt. The latter gentleman states (speaking of operations done under the influence of chloroform): "In some cases, reaction is never thoroughly established, the desire for food never returns, and the patient sinks as it were steadily, and dies from exhaustion in 12-24 hours. These cases are far more numerous than is generally supposed, and many of them may be fairly termed deaths from chloroform, but are never so returned."

Mr. Holmes brought to bear on the subject the statistics of St. George's Hospital, and showed the converse to Dr. Arnott. Previously, for four years, to the introduction of chloroform at this hospital, the mortality from pyæmia had been 5·25 per annum. latterly (*i.e.* for the ten years subsequent) it had been 4·79 per annum. Many arguments *pro* and *con* were adduced by these authorities. Dr. Arnott still insisted that the increase in the mortality after amputation since the introduction of chloroform was respectively in four London hospitals 10·9, 10, 12·5, and 17·6; whilst the provincial average increase was 12·5, per cent. Dr. Fenwick objected that Dr. Arnott's observations embraced different periods at different hospitals. He confined his observations to one,—viz. the Newcastle Infirmary, and concluded generally on the decrease of mortality since the introduction of chloroform. The danger from shock, he says, is lessened in the case of traumatic amputations, and altogether lost in the case of operations for disease. The only exceptions to the general rule of the decrease of the mortality after amputation since the use of chloroform, were

in cases of traumatic amputations of the leg and pathological amputations of the arm. Only two cases of the latter were observed, so they may be thrown out of the scale on the ground of their being insufficient evidence. The excess in the former case was 5 per cent. Dr. Arnott replied to this, urging the insufficiency of the records.

Since Dr. Arnott's were the tables which apparently furnished the best established record of cases of amputation in the London hospitals, prior to the introduction of chloroform, I felt bound to receive deductions from them as the general expression of the truth—*i.e.* the truth as to the increase of the mortality since the practice of anæsthesia. The next question that arose was—Is this the relation of cause and effect? Deaths from chloroform—recognized deaths—are incontrovertibly rare. Such, also, usually occur in instances of the most trivial operations, and do not come within the scope of our subject. It must, I think, be allowed that chloroform, administered duly diluted with atmospheric air, and by those who know that they are dealing with an agent capable of inducing palsy of the heart or suffocation, is comparatively harmless in its *evident* results. The only case in which it may act prejudicially, is by its encouraging morbid phenomena.

Dr. Fenwick has remarked that limbs are now saved which, long ago, would have been sacrificed without the smallest hesitation. Undoubtedly, the surgeon in times past would have preferred, for the patient's safety and his own convenience, an amputation to a protracted operation for the removal of diseased bone—now, too, especially, the growing practice of resection of joints restricts the operation of amputation to the most unfavourable cases.

These are circumstances which would, without doubt, tend to exalt the rate of mortality after the operation. Still, I did not deem them of sufficient magnitude to account for the great increase which Dr. Arnott adduces in his tables. I was induced to search further. The first question was, of course, the correctness of the first hypothesis—that the general rate of mortality before anæsthesia was about 20 per cent. Searching for data, I was told that there were deposited with the Medico Chirurgical Society, records by the *London Medical Society of Observation* of the principal operations. Through the kindness of Mr. Henry Lee, I was enabled to consult this volume which contains records of amputations performed in all the principal London hospitals. I found these to be most complete and circumstantial—the patient's name, the kind of operation performed, the cause of amputation, the result, the period before recovery, or death, &c., being distinctly stated. The observations extended from 1837 to 1841. But, though the periods of observation seemed to be the same in the different hospitals, yet in some of these years fewer operations

were recorded than in others. To avoid this objection, I eliminated the records for the year 1840, wherein a large number of cases were observed, and dates follow each other with great regularity. This, surely, must be an approximation as near as possible to the truth. For the results, I refer the reader to table III.; therein it will be seen how much greater than 20 per cent. was the mortality in 1837-42, and how still greater in the year I had selected for the sake of greater correctness, 1840.

For the years subsequent to the introduction of chloroform, I consulted the record of operations, published periodically in the "Medical Times and Gazette."

But this is a question of very high importance, and I have thought it well to consult further for argument. I must beg attention to table V. A. which shows the comparative mortality after the several members. In every case the mortality since the introduction of chloroform has been diminished. I have included in the table only the results of the year 1856, as a type of the period subsequent to anæsthesia. But, in 1855,

of amputation of the thigh, 16 died out of 69=23 per cent.
of „ „ „ leg, 14 „ „ 39=35 „
„ „ „ „ arm, 5 „ „ 29=17 „

In the first half of 1857,

of amputation of the thigh, 10 died out of 36=27 per cent.
„ „ „ „ leg, 3 „ „ „ 24=12·5 „
„ „ „ „ arm, 6 „ „ „ 23=26 „

We will next investigate the mortality in reference to the cause of amputation. First, in regard to traumatic amputations. In earlier times these have been very fatal—so fatal, those of the thigh, that during war they have been by authority interdicted altogether.

Compare with the first column of table V. A., the following:—

TABLE VII.

Traumatic Amputations.

	Crimean War.	1837-42.	Jan., 1856, to July, 1857.
All Amputations.....	27·3	37	33
Thigh.....	64	58	60
Leg.....	30·3	35	31

The first item of this table must not be taken as evidence, because in the Crimean results are recorded amputations of the

tarsus and fingers, which are not in the others. Apparently, however, in civil practice, the rate of mortality in traumatic amputations of the chief members, has decreased 4 per cent. But in amputations of the thigh and leg, taken collectively, a striking similitude is observed in the results; whilst the mortality from thigh amputations seem to have slightly increased. This seemed to me to be the most doubtful point in the whole investigation—viz., whether in cases of severe accident operations should be done under chloroform. Men in robust health are not so well calculated to withstand the accumulated shock of a severe injury and a severe operation, as those whose powers of life have, as it were, gradually submitted themselves to the dominion of disease, and who are struck but by one *sudden* blow—the operation. The question that arises is—"Is chloroform an ulterior depressant?" Does it, after all its apparent effects have passed off, exercise a depressant influence which the feeble powers of life are sometimes unable to countervail? In order to bring some evidence to bear on this question, I performed some experiments on animals, which, though far from being conclusive evidence, may yet be not entirely without value.

Having taken a pair of white mice, apparently similar in point of nutrition, I divided, with a fine flat needle, their spinal cords, a finger's breadth above the pelvis, so as to produce complete paralysis of the posterior extremities. One of these was allowed to remain in the air, the other was placed under a glass jar of 180 cub. in. capacity. Through a tube entering this jar, 4 grains of chloroform were introduced and allowed to fall on a piece of blotting-paper suspended therein. (This is the proportion which, according to Dr. Snow, will fully produce the third degree of anæsthesia). After having been allowed to remain in the jar five or six minutes, the mouse was taken out and placed in favourable circumstances for its recovery.

The period of the death of each of these mice was noted. To similar operations and similar treatment, other mice were subjected. The following were the results.

DURATION OF LIFE IN WHITE MICE AFTER DIVISION OF THE SPINAL CORD.

	Chloroformed.		Not chloroformed.	
A	4 hours, 33½ minutes.		B	25 hours, 1 minute.
C	4½ „		D	23 „ 47 „
E	17 „ 48 „		F	„ 10 „
G	26 „ 25 „		H	21 „ 32 „
I	21 „ 54 „		K	22 „ 42 „

The average duration of life, then, in these placed under the influence of chloroform, was 14 hours and 9 minutes; whilst, in the others, it was 18 hours and 38 minutes. The mouse A was the most injured by the operation. C died whilst under the influence of chloroform. If anything can be deduced from these experiments, therefore, it is that chloroform has some slight depressing action in cases of severe injuries, shortening the expectation of life.

We next come to the influence of chloroform on the results of pathological amputations, and here, apparently, there is happily no room for doubt.

In cases of diseased bones and joints, the mortality after amputation, as deduced from the tables of the London Medical Society of Observation, from 1837 to 1842—prior to the advent of chloroform—was 33 per cent. The mortality, as deduced from table II., in 1856, and the first half of 1857, was 12·9.

In cases of *thigh* amputation in the former case, it was 50 per cent.—in the latter, 16·9.

In *leg* amputations, 29·2 in the former case, 10·5 in the latter.

In *arm* amputations, 44·8 in the former; in the latter table no death is recorded.

This evidence seems overwhelming. It seems to show that not only chloroform does not exert a baneful influence on patient's submitting to chloroform, but that it exerts an influence to the preservation of life.

Since it might be objected that in the period adduced the mortality chanced to be unusually low, I have also investigated the mortality in cases of amputation for diseased bones and joints, in the years 1854 and 1855. In these instances, of 103 amputations of the thigh, 21 died—mortality 20·3 per cent.; of 35 of those of the leg, 8 died—mortality 22·8 per cent.; of 12 arm amputations, 1 died. Thus, though these numbers show a higher rate of mortality than those previously cited, they yet most distinctly favour the conviction that the mortality, in cases of amputation for diseases of bone and joints, has greatly decreased.

From all these observations on the subject of the influence of anæsthesia on the results of amputations, I am led to the conclusion that in cases of disease wherein amputation is necessitated, confidence in chloroform should remain unshaken; but that in cases of severe injuries it behoves at least to ponder well before its use. It seems to me, that in this case, the humanity which would urge the sparing of suffering would regret but little, the withholding of the anæsthetic agent here; for the sudden shock to the nervous system has already to some extent blunted the sensibilities, and rendered less poignant impressions of pain.

We now come to the consideration of the operation itself.

I shall attempt no comparison of the results of *flap* compared with *circular* operations, but regard the question whether the

former or the latter be employed as a pure matter of convenience. As Mr. Fergusson remarks, "It is indeed difficult to imagine why the circular incisions should cause all the above troublesome results (viz. non-union, suppuration, protrusion of bone, exfoliation, tumours on the end of bones, and so forth), whilst the flap method should avoid them." Only the circular, our Professor considers, a more difficult operation, "or, at all events, there is greater chance of a mistake occurring in the one than in the other."

Here it behoves me to speak of a new method of amputation, recently introduced by Mr. Teale, of Leeds. It nearly concerns our subject, for Mr. Teale proposes it "in the hope of somewhat diminishing the mortality of the operation."

The principle of the operation, which is designated "Amputation by a Long and a Short Rectangular Flap" is this: (1) to form an anterior flap, of length and breadth each equal to half the circumference of the limb, consisting of such parts as do not contain the large nerves and blood-vessels—(2) to form a posterior flap, containing the principal vessels and nerves of which the length is one-fourth that of the former flap—(3) the bone being sawn through, to unite the angles of these flaps by sutures, and to retain their surfaces in contiguity by other sutures.*

The chief advantages of this operation are, according to Mr. Teale, these—1st, the avoidance of tension—no strappings, "*no dressings whatever*" are required; the first flap is amply long enough to cover the bone and to compensate for the shrinking of the short flap.—2nd, the end of the bone covered by muscle and skin, but *not* by large nerves.—3rd, non-disturbance of the plastic process—the long flap soon becomes united with the severed bone, thereby the open veins of the latter are, at an early period, closed; the large nerves in the short flap being undisturbed, have a good opportunity also to become quickly permanently closed, and so incapable of imbibing putrid matter.—4th, the free outlet provided for purulent and other discharges through the favourable position of the incisions. Fifty-six amputations performed in this manner are circumstantially recorded in Mr. Teale's work. Death occurred in only seven instances, thus the mortality was only 12·2 per cent. In amputations of the thigh and leg for disease, the numbers are nearly large enough to admit of comparison with those done by the old-established methods in London and Provincial practice. In amputations of the thigh (taking 17 cases) the mortality is 17·5 per cent. In amputations of the leg (taking 27 cases) 3·7 per cent.

These numbers contrast very favourably with all other statistics

* "On Amputation by a Long and Short Rectangular Flap," by Thomas P. Teale, F.L.S., F.R.C.S. London: Churchill.

of amputation. Of course they cannot yet be taken as the absolute expression of the advantage of this operation. All these points, however, lead to the hope of their commencing a brighter page in the annals of amputation. Looking at it in the light of its convenience, we are attracted to it by its preserving the nerves from injury in their normal relative positions, and hence, probably, preventing those painful, though not evidently fatal, sequelæ of amputation dependent on nervous irritation or empaction, as well as by its protection of the bone, which has often undergone, and sometimes, too, now undergoes unhealthy change. And in the intenser light of its influence as regards life and death, probabilities seem to lean towards it. I may hope that in some future time, one worthier than I may read an essay before you on this subject, showing that the operation has lost that great fatality which I am obliged to show you it at present bears.

III.

The operation performed, we patiently await the result. Of the chances of the patient's recovery or death enough has been said already. How long before the one or the other ensues is the next question. I have deduced the following from the records of the London Medical Society of Observation:—

Average Periods of Recovery and Death.

		Recovery.	Death.
Thigh	. . . . .	58 days.	16·6 days.
	Traumatic . . .	93	11·2
	For diseased bones, &c.	48	20·2
Leg	. . . . .	77	14·8
	Traumatic . . .	84	12·5
	Diseased bones . .	42	19·2
Arm	. . . . .	67	11·7
	Traumatic . . .	66	15·3
	Diseased bones . .	110	10

It is strange that in the case of amputation of the upper extremity, the recovery should be more tardy and the advent of death more rapid than in the other cases. It is strange also that the same should be the case in pathological compared with traumatic amputations of that member.

Not the least interesting point in this enquiry is the consideration of the IMMEDIATE CAUSES OF DEATH AFTER AMPUTATION. These causes are many, but the most frequent and the most

important range themselves under but few heads. It will not be attempted here to give a clinical history of each of the causes of death after amputation; but to consider them especially as influencing the rate of mortality. The following table includes all the cases (except those the termination of which is not mentioned) recorded in the London hospitals from January 1856 to June 1857.)

TABLE VII.

Seat.	No. of Cases.	No. of Deaths.	Causes of Death.
Hip joint	3	1	Secondary hæmorrhage
Thigh ..	106	33	Exhaustion, 17 Pyæmia, 10 Shock, 3 Secondary hæmorrhage, 1 Tetanus, 1 Sloughing stump, 1
Leg	49	17	Pyæmia, 9 Exhaustion, 7 Pneumonia, 1
Upper extremity..	60	15	Exhaustion, 8 Shock, 3 Pleuro-pneumonia, 1 Cause unmentioned, 1

Hence it appears that the two most common causes of death after amputation are—(1) shock and exhaustion, (2) pyæmia—that the former is now-a-days the most frequent, being twice as frequent as the latter.*

SHOCK AND EXHAUSTION.—I have before spoken of the primary effect of amputation on the nervous system of some patients; a depression of the vital powers ending only in their extinction. Such may happen very early: the patient may succumb within twenty-four hours, the impression being lasting and unremitting. This unremitting form may justly be termed shock. Or the morbific influence may have an effect not so rapid; may have many a struggle with the powers of life; and by retarding the processes for repair, and encouraging morbid phenomena, gradually weary out the system. Death, in these cases, may occur in from days to weeks after the amputation. In shock, besides the nervous depression, secondary effects occur on the vascular system, a rapid, fluttering, feeble pulse; on the respiratory function, laboured and sighing breathing.

* Taking the period from 1854 to 1857, the mortality from shock and exhaustion, compared with that from pyæmia, is 51·2 to 32·7

The eyes stare listlessly, the face has a blank expression (if such term be allowable) the cerebral functions become more and more imperfect, the heart's pulsations cease, and death ensues.

A healthy man undergoing primary amputation is more likely to die from shock or exhaustion than a patient enfeebled by disease undergoing a pathological amputation. These effects are, as a rule, most frequent in cases of the most severe operations. Hence, they are most commonly developed after amputation of the thigh. The upper extremity seems to come next in point of frequency. As might be supposed, after *primary* amputation of the thigh, they are of *most* frequent occurrence. Thus, as shown by Table VI., in cases of this operation the frequency of cases of death from shock was 2 in 9 deaths, and from exhaustion 4 in 9—whilst in the case of amputation for disease of the knee-joint, there were, in 9 deaths, 2 registered shock and 1 exhaustion. Mr. James, of Exeter, thinks that the amputation being done through injured parts is almost the sole cause of the mortality after primary thigh-amputations. "Though," says this author, "the immediate effects of shock may have passed off an impression is made on the system, rendering it more liable to secondary inflammations and suppurations, and an impression is made on the blood, rendering it unfit for the reparative process." "To these are due many of the phenomena usually attributed to the imbibition of a septic principle, or to the effects of vitiated air."

PYÆMIA.—This fearful and intractable affection is well known to cause a large proportion of the deaths from this and other severe operations. There is not space for the record here of various writers' opinions on this malady. I shall hope for pardon, therefore, for anything I may say dogmatically.

Whilst suppuration is occurring, if the patient have one or two distinct rigors, pyæmia is to be feared. If, in addition, diarrhœa occurs, great prostration, bluish or yellowish hue of the skin, delirium or stupor, laborious breathing, quick and small pulse, swelling about the joints, excessively painful—pyæmia, for certain, exists. Very frequently, the lungs are affected—inflamed, and infiltrated with pus.

To account for these effects, many theories have been advanced—they resolve themselves, however, into this general fact; that they are produced by a *blood poison*. It has been thought generally that they were due to the admixture of pus or putrid matter with the blood. From the present state of the question, it would appear most probable that they are due to the influence of a peculiar animal poison.—(For an excellent account of the theories that have been proposed, I beg to refer the reader to Dr. Hughes Bennett's Clinical Lectures, 2nd Ed. p. 849). Whatever be the physical nature of the poison, the system tries to eliminate it. This elimi-

ination cannot take place by natural secretion; an acutely inflammatory process is instituted. By the depressing agency of the poison, typhoid symptoms have been already induced; and the inflammation goes on to suppuration. Of the external circumstances favouring its occurrence, we also know but little. It may occur after an operation for phymosis, just as after amputation. In Table VI., it seems very frequent after primary amputations of the leg.

SECONDARY HÆMORRHAGE.—Modern surgery and modern care have reduced the mortality from this occurrence to a minimum. It is only recorded as cause of death in two cases, in the "Medical Times" of a year and a half (see Table III.)

It may be caused within a few hours of the operation from the detachment of the ligature, or from a vessel which, at the time, was not tied—or from sloughing of the wound opening unclosed vessels, at a later period—or, later still, from ulceration of the arterial coat at the time of the spontaneous separation of the ligature.

AFFECTIONS OF STUMPS.—These affections, painful though they be, have apparently but a small share in the mortality. The most painful affection of stumps is that produced by the impaction of a nerve therein; but protrusion of bone has been the cause of much suffering and exhaustion.

One example of death from *tetanus* is recorded in Table VII. *Hospital gangrene* has been, at different times, according as it has been prevalent, the cause of many deaths.

It now only remains, before conclusion, for me to consider some of those external circumstances which are supposed to influence the rate of mortality after amputation.

Crowded Hospitals.—In such, general debility and irritability are common. Hæmorrhages, from the surface of an irritable stump, are frequent. Says Mr. Guthrie:—"If the state of the stump, in any case, depend on the bad air of the hospital, the patient had better be exposed to the inclemency of the weather than allowed to remain."

Zymotic Influences.—According to Guthrie, where febrile diseases are endemic, purulent deposits often prevail, constitutional irritation is great, the stumps do not unite, or, if united, open out and slough, and frequently implicate the veins.

After amputation, patients are frequently prone to prevailing fevers. After the battle of Waterloo, the wounded of one regiment were sent some to Brussels and some to Antwerp. The former suffered, after amputation, principally from inflammatory fever—the latter from an endemic fever then prevalent at Antwerp, and peculiar in commencing as an intermittent and ending as typhus.

TREATMENT AFTER THE OPERATION.—There seems yet to be

too much opposition to that system which would support the vital powers.

In Paris lately, nearly half the cases were fatal. They do not stimulate, and their hospitals are too crowded.

Each coming year may we see a diminution in the rate of "Mortality after the Operations of Amputation;" and know more of, and be more powerful to countervail, "the Causes of that Mortality."

PAMPHLETS

13