

supposed naturally to form much young epithelium. The first parent globules may be aborted young epithelium cells, and these may be the ancestors of others which form the bulk of the mucus, begetting them with the extreme rapidity characteristic of generation in low organic life.

If this be true, mucus may be viewed as a parasite, receiving from the body its nutriment indeed, but not its form nor its claim to vitality.

Doubtless the growth of mucus is most rapid where there is normally a thick layer of epithelium, and where a large growth of young epithelium is constantly being formed to replace the rapid moulting. But still it is much quicker on localities with a thin layer than could be accounted for by each globule being an aborted scale; there could not be enough aborted scales to furnish so much mucus so full of globules. I believe, therefore, that it grows on the surface by their budding and splitting in continuous succession.

If you compare pus which has been some time accumulating on the surface of a mucous membrane with that which is being freshly formed, you will remark a decided difference in the globules they contain. Take some accessible mucous surface—the eye, or the vagina, for example—thickly covered with opaque secretion, and you will find the globules nearly all of a size, even and spherical. Then wash it clean with cold water, and examine the first-formed secretion; the globules are of all sizes and of irregular shapes, oval, bulging, budding, with or without nuclei. This seems to indicate a general change of form by time—a certain completion of creation in that which has been longest formed.

When we see, as I have described, the globules of mucus budding, dividing, and subdividing in active haste—new foci of independent vitality generated and multiplying even when separated from the body,—it might appear that a local increase of life was being exhibited. Certainly a greater bulk of living substance is formed by a membrane secreting mucus or pus, than is the case in the healthy state; for the secretion outweighs by a hundredfold the daily quantity of epithelium which its original material was destined to make. But what sort or degree of life is exhibited by this secretion? Is rapidity of multiplication to be looked upon as evidence for or against force of vitality? Against, I think. The lower we go in the scale of creation, the more quickly and the more copiously do the living forms representing the various classes reproduce their kind. The less functions and force and intensity of existence they have, the more prominent becomes reproduction as the main object of their being created. This seems to be the universal rule, to be traced all through living beings till we get down to the *Amœba* and the mould, in which no trace of a function can be detected beyond the multiplication of their simple substance.

Here, indeed, it becomes difficult to draw the line between organic and inorganic. Instead of being in contrast and in conflict with the physical forces of inanimate nature, vitality seems to obey laws which closely resemble them. The main point of distinction seems to be the growing from a centre outwards of organic, and the aggregation towards a centre of inorganic, individuals.

When organic matter destined to form part of an animal has attained the end of so becoming a member of a consistent whole, it ceases to multiply itself. Cells do not normally go on splitting up and producing cells similar to themselves in situ. The highest development of their vitality is ceasing to exist as growing matter. A fully-formed epithelium scale does not produce another scale, nor the nucleus of a muscular fibre another nucleus. The retention of reproductive force is an expression of the lower and an exclusion from the higher functions of life.

In the mucous globule, then, we find organic matter, whose destination was the formation of epithelium, arrested in its development when it has attained only the lowest degree of life—that lowest degree of life being the function of reproduction.

**LUNATICS IN WORKHOUSES.**—The Commissioners in Lunacy state, in their last report, that they have never ceased to be of opinion that workhouses are altogether unsuitable for the treatment of the insane, and that many curable cases are thus kept in gloomy unfurnished wards, with low diet, and narrow airing courts, until their disease becomes chronic, and their cure hopeless. Yet a return, just issued, stated that in the single year (1861) no less than 5072 lunatics were received into workhouses in England and Wales. In the majority of instances there is no lunatic ward in the workhouse, and the insane, if not dangerous, are mixed with the sane.

## CASE OF SPONTANEOUS CLOSURE OF THE AXILLARY ARTERY AFTER DIVISION BY A GUNSHOT WOUND,\*

RECOVERY OF THE PATIENT.

By W. C. CALTHROP, Esq., M.R.C.S.,

SURGEON AND AGENT TO H.M. COAST-GUARD.

ON the 18th of June, 1858, I was summoned to attend a young gentleman aged about fifteen years, the son of Mr. S—, of Maltby-le-Marsh, Lincolnshire. He had been seeking in a ditch overhung by a hedge for a bird he had just shot. In searching he used the butt-end of his gun, which was reloaded and on full cock. He was at the time standing on the edge of the ditch, and holding the gun in his right hand, which was about twelve inches from the muzzle. In order to reach sufficiently low in the ditch he was obliged to stoop his body forward pretty much, which brought the anterior and posterior margins of the axilla almost in a line with the axis of the gun-barrel. While in this position the trigger became entangled and the discharge occurred.

He considers that the muzzle of the gun could not be more than twelve nor less than six inches from his shoulder at the time. It was loaded with No. 4 shot. He walked immediately to a house very near at hand, which however he had much difficulty in reaching, and lay upon the floor in a deep faint; indeed, extreme faintness continued until I saw him. On the way to the house, which was distant about a hundred yards, the blood, to use his own expression, “pumped from the wound.” The bleeding was immense. As the accident occurred some miles away from my residence, it was nearly two hours before I saw him. On my way I met Mr. Arkwright, of Accrington, a medical friend, who kindly accompanied me, and gave me the benefit of his assistance and advice, concurring at the same time in my diagnosis. The patient, on returning to consciousness, did not seem at all afraid or nervous about himself. The countenance was more blanched than any I ever saw, the lips being quite white, like paper. The pulse on the sound side could scarcely be felt, and that on the wounded side was not perceptible at all. A bandage had already been placed outside his dress over the wounded part, and this for the moment was allowed to remain. The extreme prostration appeared to demand peremptorily a stimulant, and, as there was not any actual continuance of hæmorrhage, a small quantity of brandy-and-water was given, which helped to revive him. He was allowed to remain a short time perfectly quiet, and gradually recovered sufficiently to be removed to his father’s house, about five hundred yards distant. This was done with great care; and as no renewal of the hæmorrhage had taken place, examination of the wound was deferred until he had been placed under circumstances more favourable for operation, if necessary, or for having recourse to whatever measures the possible exigencies of the case might require.

He was placed in bed, upon a mattress, in a large airy room, with the windows open, and an anodyne was given to him. The axilla was less swollen or infiltrated than I should have expected from what, owing to the loose condition of the cellular texture in the axilla, is common in such cases. The wounds were treated with cold water changed every few minutes throughout the night. His father, a gentleman of great intelligence, undertook the charge of applying them, as well as the after-care of him, scarcely leaving his son’s bedside at all for the first fortnight. To the constant and careful fulfilment of this duty, especially in the early period of the treatment, I attribute in great measure the successful restraining of the hæmorrhage, and the capability of dispensing with surgical operation.

In accordance with the long-established rule in surgery, which I cannot express better than in the words of Mr. C. H. Moore, (in his recent paper on Wounds of Vessels, in the “System of Surgery, by various authors,” vol. i., p. 690,) that “no surgical operation should be performed with the object of securing a wounded artery unless it be actually bleeding,” I did not further interfere. Under apprehension, however, of a fresh outburst of hæmorrhage, Mr. S— was made acquainted with the means to be used, if necessary, until my arrival, and had great facility in comprehending in what way

\* For this paper the author was awarded the silver medal of the Medical Society of London.

they were to be employed. Happily, time passed on and no renewal of hæmorrhage took place.

How frequently spontaneous cessation of hæmorrhage occurs on the field of battle, or how long life might continue, and final cure follow, without any operation, could prompt attendance and care always be at hand, military surgeons do not, and indeed cannot, state. Amongst the occurrences, however, of civil life we find extraordinary instances of large arteries, the largest in the body even, being wounded, in which the duration of life is longer than might be expected—cases which scarcely leave room for surprise that the patient to whom this paper refers was able to walk, even with difficulty, to the place where syncope overtook him. "No. 1566 in the pathological series of the Hunterian Museum is a part of the thoracic aorta of a man ruptured transversely through all its coats and round nearly five-sixths of its circumference. He was supposed to have lived ten minutes after a waggon passed over his body." "In the museum of the Middlesex Hospital is the lower part of an abdominal aorta cut half across by a pistol bullet. The patient was under the care of Mr. Shaw, surgeon to the hospital, who had the opportunity of ascertaining that he survived the injury for an hour and a quarter."\*

The temperature of the arm on the wounded side rapidly fell, and it was therefore enveloped in worsted and flannel coverings, but still without restoring its warmth. On the fifth day of the accident there appeared to be a disposition to mortification, with a sensation (but probably a mistaken one) of slight crepitation in the cellular tissue. Under these circumstances, I requested that I might have the advantage of the opinion of Mr. Hewson, of Lincoln. As the result of our consultation (in which Mr. Hewson's view of the nature of the injury was the same as my own), he advised the continuance of my former treatment; but proposed the use of wool, as it comes from the sheep's back, to be wound round the arm in lieu of the cotton-wool, worsted, and flannel; which plan, indeed, appeared to answer the purpose of preserving the warmth of the limb better.

The case was at a later period seen by Dr. Chowne, who entertained an apprehension, but not a conviction, that the axillary artery itself was divided. On seeing the patient again, however, after sufficient time had elapsed to show the permanent effects of the injury on the muscular power of the limb, he concluded that division of the main artery had taken place.

Until suppuration had ensued, which was on the ninth day, the patient had very light and spare diet, with an occasional cup of tea and frequent doses of laudanum, which latterly required to be large. As the suppuration advanced, the pain, which had been extreme, abated, and the quantity of laudanum was diminished. He was now allowed brandy, and had ammonia with bark as an additional stimulus. He had animal food, chiefly mutton, *ad libitum*, and porter, of which he availed himself very heartily. At this time poultices were used instead of the cold cloths. There was not anything peculiar in the after-treatment. The suppuration gradually diminished; the wound of entrance (*b*, Fig. 1) healed kindly; but that of exit (*a*, Fig. 2) indicated the existence of irritation from a portion of dead bone, of which a few small pieces were at a later period extracted; after this the wound granulated very healthily, and was completely healed about four months after the injury.

The charge of shot entered and pursued its course almost as a ball or any other compact body would have done, being discharged at so short a distance from the wounded part. Its entrance was at the lower and anterior part of the axilla (at *b*), just passing over the lower fibres of the pectoralis major; its exit was at *a*, as shown in the engraving, at a point a little distance below the glenoid cavity of the scapula—probably dividing or injuring the long head of the triceps. Some of the shot, however, were deflected, and passed completely under the scapula, and were felt under the skin between the base of the scapula and the vertebral column.

During the first winter after the injury the fingers almost perished, gradually shrinking away and turning black. Eventually a portion of their ends sloughed, but left healthy granulating surfaces, which ultimately healed kindly. At this time the patient was taking cod-liver oil. When spring came round the fingers partly refilled, and looked rather more natural. Whether this was owing altogether to the return of warm weather, or partly, or indeed mainly, to improved circulation in anastomosing arterial branches, I do not venture to affirm; yet the latter was most probably the main cause, and this appears to be the more likely, as, during subsequent winters, equally cold, the hand has not suffered nearly so much, although

he still, both in winter and summer, has it protected by being wrapped up in cotton wool.

FIG. 1.

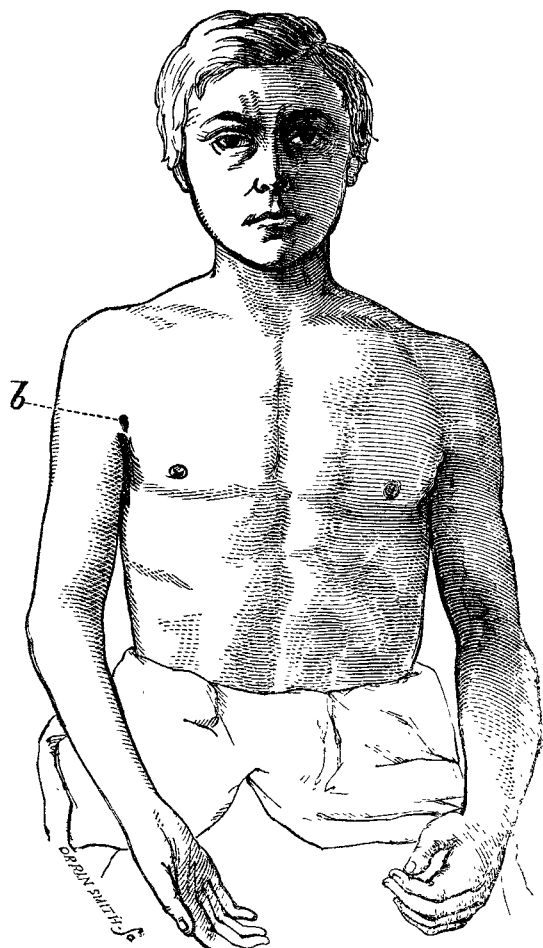


FIG. 2.



I have stated that on my first visit after the accident the pulse in the wounded arm was not perceptible—that is to say, neither the radial nor the brachial artery could be perceived to move in any part. This continued until the twenty-ninth day, when I thought I could perceive a slight thrill in the radial, and also in the brachial; the highest part at which this thrill could be felt was about the upper portion of the middle third of its course.

\* Holmes's System of Surgery, vol. i., p. 668. Trans. Pathological Society of London, vol. x., p. 163.

As the hæmorrhage ceased spontaneously, and as recovery followed without the wounded vessel being tied, a first impression might very reasonably arise, that the axillary artery could not be that which was wounded; but surgeons are daily becoming less subservient to the dicta of ancient authorities, and now judge of events on their own peculiar merits. I from the first came to the conclusion that the divided artery was the axillary, and subsequent occurrences and collateral facts are in accordance with that, and at variance with the opposite belief; these facts, moreover, are not hypothetical, but tangible and demonstrable.

In reflecting on the case, certain sets of circumstances require to be carefully considered.

1. The profuse hæmorrhage at the moment of the injury.
2. The absence of pulsation in the brachial and radial arteries, after it had been restored in the sound limb.
3. The immediate loss of heat and of sensation in the wounded limb.
4. The permanently injured circulation, the permanent diminution or almost entire loss of sensation, the extreme wasting, and the persistent absence of muscular power, in almost all the muscles of the wounded limb.

Although, in consequence of the great mobility of the arm on the shoulder-joint, the exact situation of the axillary artery in relation to other parts is very different at different times, and although even the cicatrices left by the wounds of entrance and of exit of the shot (as shown in the engravings) are not infallible guides as to the relative place of that artery at the moment of the injury (since the artery would follow the movements of the humerus, while the cicatrices remain nearly stationary), yet we find sufficient evidence of the real track of the shot in the *injuries of certain parts* and the *immunity of others*.

So strongly impressed upon the minds of surgeons has been the opinion that when the axillary artery is divided it *must* either be tied or the patient must die, that I am sensible of the necessity of adducing other evidence than inferences drawn from the supposed position of the parts at the moment of the wound being inflicted, in support of my belief that the present is an exception to such rule.

*Collateral evidence derived from the state of the circulation and of other functions in the wounded arm.*—When syncope, during which the hæmorrhage was arrested, had passed away, and a very perceptible pulse had returned in the sound arm, not the slightest movement existed in the vessels of the wounded arm; and at the same time, while normal sensation and normal temperature and power of motion remained in the sound arm, the wounded arm had lost its sense of feeling almost wholly, the hand was useless, and the limb became almost icy cold.

*Collateral evidence deduced from the anatomical position of the arteries.*—We are aware that there are few arteries in the body more liable to varieties as to the exact points at which they are given off from their respective trunks than those of the axillary; but the normal origins and the normal distributions are those only which we are at liberty to assume for our reasoning in the present case.

Of the large branches given off from the axillary artery—viz., the thoracic, the subscapular, and the posterior and anterior circumflex—both the thoracic and the subscapular are situated too high up in the axillary region to be *in* or even *near* the shot track. The circumflex arteries are indeed sufficiently low to have been in a doubtful position as to danger of being wounded; but then they are so situated in relation to the nerves, that if either had been wounded, the muscles which in the present instance have lost their power would have retained it. However improbable a spontaneous arrest of the hæmorrhage, followed by what may be called the spontaneous final closing of the divided axillary artery might seem, yet all the circumstances immediately attending the accident, the circumstances attendant on the progress and treatment of the case, and those also which have been persistent and exist at the present time, are in accordance with the opinion that the artery divided was the axillary.

*Collateral evidence derived from the injured nerves.*—With regard to the nerves, I need not say that we may with great exactitude deduce from the loss of sensation or of nervous power in any given part or muscle the particular nerve or nerves that have suffered. In the present instance the parts and the muscles which have lost sensation and power of motion are supplied by nerves which lie in close juxtaposition to the axillary artery, so close indeed, that the vessel being divided, the nerves must be divided also; and on the other hand, if it had been either of the large branches given off by the axillary instead of the axillary itself that had been divided, the parts

and muscles which have now suffered in sensation, in motion, and in bulk, would have escaped.

Two very important nerves—indeed the main nerves of the arm, forearm, and hand—the median and the musculo spiral, which in the situation of the wound lie, the one directly upon or in front of the axillary artery, the other directly behind or under it, are, there is every reason to believe, both divided.

Although scarcely any muscle of the shoulder, the arm, or the forearm retains the whole of its normal power, yet some which are mainly supplied by nerves which we have reason to believe have escaped injury, are still enfeebled as a consequence of the low vital state to which the limb is reduced from deficiency of nutrition. The deltoid, for example, supplied by the circumflex, which is derived from the posterior cord of the brachial plexus, is not strong, although, together with the trapezius, it raises the arm above the horizontal line. The biceps, the coraco-brachialis, and the brachialis anticus, although wasted, retain considerable power, being supplied by the musculo-cutaneous nerve, which is considered *not* to be wounded. The triceps, on the contrary, supplied by the musculo spiral, is both wasted and perfectly useless. The biceps and brachialis anticus can flex the forearm; but when the arm is raised to the horizontal position, the triceps is utterly unable to extend or to move the forearm in any degree from the flexed position, and the patient is obliged either to lift it and extend it by means of the sound hand, or to lower the arm and let the forearm fall into the extended position by its own weight. Although other muscles might be particularized in which loss of motive power is strictly coincident with the injury of nerves which must have suffered along with the artery, it will be sufficient to speak of them generally, and together with those of the forearm, the more especially as the low state of vitality in the limb, from the low standard of the circulation through it, is such as to conduce in itself to the loss of power. The pronators, flexors, supinators, and extensors of the forearm have all lost their power; and although there exists slight capability of flexing the fingers, that effect appears to be produced by the action of the biceps on the fascia of the forearm.

*Collateral evidence deduced from the immunity of the vein.*—Happily this disastrous accident did not involve the vein in the mischief which it has done, the shot having passed through the axilla in that section of the axillary region forming the lower third, which is admirably defined in Hancock's translation of Velpeau's "Anatomy of Regions," and is there called the "subpectoral triangle." In that part the vein is not in contact with the artery. Nothing contributes more to the defining of the exact situation of vessels than the operations which the surgeon may be called upon to perform; and Mr. Samuel Cooper says, in regard to the exact relative position of the axillary artery, and the difficulty of tying it in any part of the upper two thirds of its course, owing to the vein lying before and over it, and to the many nerves around it, that the difficulty is not so great in the lower third, as the same obstacles do not exist; and, still speaking of the axillary artery at this part, says, "at its inner side is the axillary vein."\* I will venture to quote another authority. Mr. Erichsen, in speaking of tying the axillary artery, says: "Below the pectoralis minor the artery and vein will be seen lying parallel to one another, the artery *not being overlapped* by the vein, as it is higher up."†

Although it is true that the artery and the vein in this region are in near proximity to each other, and that the danger of the vein being wounded was so great as to render its escape seemingly almost impossible, yet I may remind the reader that in the case of a wounded soldier, adverted to in the "Transactions of the Pathological Society," a ball actually passed between the femoral artery and vein without opening either. This preparation, says Mr. Guthrie, "is unique, and is perhaps the only one in existence proving the elasticity which vessels possess, and their capability of avoiding to a certain extent an injury about to be inflicted on them."‡

It is not necessary that I should here state the broad fact that even large arteries, as the femoral or the axillary, are capable, by their own intrinsic powers, when completely divided, of arresting the passage of blood through them, without any assistance from art, or even from the support of the surrounding parts—a fact the knowledge of which must be indeed ancient; since theories have been propounded and quoted as to the means employed by nature, as well as by art, from Celsus, Rufus, Galen, and Ætius,§ and by later authors.

\* Surgical Dictionary, p. 249.

† Erichsen's Science and Art of Surgery, p. 552.

‡ Guthrie on Wounds and Injuries of the Arteries. 1846. p. 22, case 24.

§ Guthrie: Lectures on some of the more important points in Surgery. Lecture II.

as Petit, Morand, Jones, Sharp, Gooch, White, Aikin, Kirkland, John Bell, Hodgson, Guthrie, and others.\*

The fact is now familiar to most surgeons that the actual force with which blood circulates in divided arteries of the limbs is far from great. Perhaps a stronger instance cannot be given than that detailed by Dr. Young of "a soldier who was wounded at Ciudad Rodrigo by a large piece of shell, which carried away his arm and splintered the humerus to its tubercles. Part of the long muscles of the arm remained, and the humeral artery hung down two inches and a half below the ridge of the pectoralis major, which retained its attachment to the shattered bone. .... The artery pulsated so forcibly to its very extremity, that, being wet, it felt inclined to slip from a loose hold of my fingers. The last eighth of an inch was contracted in diameter so much as nearly to close the orifice of the vessel, which was the size of a pin's head; and that orifice shut up by a little blood, merely a very thin layer of which covered the extremity of the vessel. On compressing the artery, and again permitting its action, and this frequently, the impulse given to the blood thus advantageously failed to remove this obstruction to its issue."† Mr. Guthrie cites the case of a soldier who had his arm carried away by the bursting of a shell. "The axillary artery, just as it was becoming the brachial, was torn across, and hung down lower than the other divided parts, pulsating to its very extremity." There was not any hæmorrhage, which Mr. Guthrie ascribes to "contraction of the very end of the artery." In this and in another instance of a similar nature, he cut off the end of the artery at less than an eighth of an inch from the extremity. In both, the vessel for nearly that distance was contracted so as to leave little or no canal at its orifice, which in these cases was filled by a coagulum of the size and shape of a very small pin.‡

We perceive that there are at least three well-defined and well-authenticated circumstances which contribute to the arrest of hæmorrhage from divided arteries, in addition to the influence of syncope.

1st. Formation of a coagulum within the vessel, as explained by M. Petit,§ forming what surgeons call a plug.

2nd. The coagulum forming such a plug within the vessel, conjointly with contraction of the orifice, together with the support given by surrounding coagula, as considered by M. Morand|| and by Sharp;¶ and

3rd. Essentially or chiefly by contraction of the end of the artery, favoured by the languid circulation in bleeding arteries, even in the absence of external support from surrounding parts, as described by Mr. Guthrie.

On the 8th of March, 1861, Mr. Hancock saw the patient with me, and concurred in my opinion of the nature of the injury, and approved of the mode of treatment that had been pursued.

In the case which is the subject of this paper, we have reason to believe that all these favourable circumstances were present: syncope occurred early, and, moreover, the patient was soon placed in a recumbent and easy position, and was permitted so to remain, in a state of almost absolute freedom from muscular action. His clothes were permitted to remain on, and a bandage was placed lightly round the shoulder, but only sufficiently tight to serve as a support, and to keep the dress in contact with the wounds, rather than to bind any part of the shoulder or arm as a ligature.

Assuming that the circulation became languid or almost "nil" during the syncope, and that the wounded extremity of the artery contracted, these circumstances alone, according to the authorities above quoted, may be regarded as sufficient, without what has been called "the support of the surrounding parts in which the vessel is situated." Although that surrounding support might have been safely dispensed with (yet that, as a rule, it is a useful addition all agree), still it was present, and under the most advantageous condition. The extremity of a wounded artery we know commonly lies in a more or less open wound, offering free egress to the blood, and involving the great risk of death before surgical care can be obtained; but a wounded artery opening into the axilla is at once placed under the most favourable conditions for the retention of blood around it, and the consequent formation of coagula. The cavity of the axilla forms almost a shut sac, and certainly a "cul de sac" even with the two orifices produced

by the injury, the egress of blood out of which would have to contend with the smallness of these wounds; and the blood would be very favourably placed for detention in the interstices of the cellular membrane of the part, and for giving support. The contact of the dress with the orifices of the wounds would render the formation of coagula within the axilla from detention of blood a still more easy occurrence. All the circumstances which were conducive to the arrest of hæmorrhage from the superior portion of the divided artery would, of course, equally conspire to a similar result in regard to the inferior portion of the artery; and with regard to the agency of any action in the extremity of the divided artery, it certainly appears, so far as is shown by Mr. Guthrie, that more is due to contraction than to retraction.

*Collateral evidence deduced from the present state of the limb in regard to vitality.*—I need not mention how often, in cases of obliteration of the trunk artery of a limb, gangrene, or a near approach to it, is the consequence. Preservation of the limb might be said to hang upon the quick or the slow restoration of circulation through the limb by means of the anastomosing arterial branches. The upper extremity, being shorter than the lower, and not requiring so great a length of time for the anastomosing process to be completed, and being also nearer to the centre of circulation, is more frequently rescued than the lower. We may see, indeed, in the struggle between loss of vitality in the limb and the effort to preserve it, an approach to that condition which we know under the appellation of "gangrena senilis" in some of its threatened forms. This condition is well described in the paper by Mr. Moore to which I have already referred:—"If the pulse has ceased beyond the injured part, the limb will become cold and pale, and care must be given to keep it warm, and to avoid all bandaging and malposition, by which the establishment of the collateral circulation might be interfered with. .... Increasing coldness of its surface and a mottled appearance .... indicate a languid circulation and threatened mortification. Even when the collateral circulation acquires a vigour sufficient to ensure the life of the limb, it is rarely the case that the latter regains its power in all respects. A limb in which the principal artery is obliterated generally remains for years in a state of feebleness and suspended nutrition. It is weaker, and, unless it be cedematous, smaller than its fellow; it is easily chilled, and may be permanently below the natural temperature. The sudden loss of the artery is sometimes never repaired by the establishment of vigorous collateral circulation; and the limb, though not dead, remains almost incapable of muscular exertion, emaciated, and cold."\*

The loss of the ordinary sensibility of the limb, the extreme reduction of its temperature, and the great absence of muscular power, have been already spoken of; it remains, however, that the *present* (Jan. 1863) condition of the limb as regards emaciation should be stated. The respective measurements of the two limbs are,—

|                                     | The sound limb. | The injured limb. |
|-------------------------------------|-----------------|-------------------|
| Round the shoulder ...              | 16½ inches      | 14½ inches.       |
| Round the middle of the biceps, 11¾ | ,,              | 8½ ,,             |
| Two inches below the elbow ... 11¼  | ,,              | 6¾ ,,             |
| Wrist ...                           | 7½              | 5½ ,,             |

Were we to contemplate this wasted and enfeebled state of the limb alone as produced by the division of a mere *arterial branch* in the axilla, we could not fail to perceive the disparity between an injury so local and so comparatively small, and results so diffused and so truly formidable.

To the quiet condition in which the patient passed the first few hours after the accident, to the careful and steady application of cold, to restraint with regard to stimulants, and to the non-disturbance of the wounded parts during the first three hours after the accident, is, I believe, due the immediate preservation of life; and the very steady, watchful, and intelligent home care and nursing which he had throughout laid the foundation, I feel assured, of the comparatively favourable results which have been accruing as time has advanced.

Withern, Lincolnshire, 1863.

\* System of Surgery, vol. i., p. 679.

**CINCHONA BARK FROM INDIA.**—At a recent meeting of the Linnæan Society, Mr. Howard exhibited the first specimens of the Cinchona bark sent from India. It was stated that these had been found to yield a per-centage of quinine and the other febrifuge alkaloids fully equal to that furnished by the bark of the same species when grown in South America. As the largest plants in the Neilgherry Hills are in full flower a supply of seed may also be expected.

\* See Hodgson on Arteries and Veins, p. 457 et seq.

† Observations and Cases of Gunshot Wounds. By J. G. Guthrie. New Med. and Phys. Journal, vol. iv., p. 269. Quoted by Hodgson, pp. 460-2.

‡ Guthrie on Wounds and Injuries of the Arteries, pp. 10, 11. 1846.

§ Mém. de l'Acad. Roy. des Sciences de l'année 1735. Quoted by Mr. Hodgson.

|| Ibid, 1736.

¶ Operations in Surgery, third edition; Introduction, p. 2.