

Observations on neuroma, with cases and histories of the disease.

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OBSERVATIONS

ON

NEUROMA,

WITH

CASES AND HISTORIES OF THE DISEASE.

By WILLIAM WOOD, Fellow of the Royal College of Surgeons, and F. R. S. E.

THE term Neuroma was first applied, by Odier of Geneva, to tumours formed by diseased enlargements of the nerves*.

In a communication, lately submitted to the Society, I stated the reasons which induced me to think that the small lenticular or pisiform tumours, occasionally met with in the subcutaneous cellular substance, and which are generally believed to be formed by a morbid increase in size of a portion of one of the smaller branches of the subcutaneous nerves, should be treated of separately, and should be considered as forming a distinct variety, at least, of disease, from the deeper seated tumours of larger

* Manuel de Medecine-Pratique, &c. Par Louis Odier, Docteur et Prof. en Medecine, &c. &c. A Geneve, 1811. P. 362.

size and more rapid growth, which are ascertained to arise from, or to be intimately connected with, the trunks of nerves, or their larger branches.

Having treated very fully, in the communication above alluded to, of the smaller tumours, under the name of *Painful Subcutaneous Tubercle*, I shall now bring under the notice of the Society, some of the more remarkable cases of the larger nervous tumours, to which the term *Neuroma* may, in my opinion, with great propriety be continued to be applied.

This disease, although fortunately not of very frequent occurrence, is an extremely interesting one, both on account of the importance of the functions performed by the parts affected by it, and of the difficulty which is occasionally experienced in determining when it is safe and prudent to attempt a cure by the extirpation of the diseased parts alone, and when it is essentially necessary to have recourse to the removal of the affected limb.

Tumours of nerves are mentioned in a very vague and unsatisfactory manner by some of the older medical authors *, but many distinctly marked cases of the disease are to be found scattered about in the works of more modern writers, both British and Foreign, more particularly of some of the latter, by whom the subject has been more attentively considered, and more ful-

* Vide the works of Hippocrates, Galen, Avicenna, John de Viego, Ambrose Paré, &c.

ly treated of, than by those of this country *. Indeed, there is no general history of the disease, nor collection of cases to be found, so far as I know, in any work in our language ; and it is with the view of remedying this defect, that I have attempted to form a history of Neuroma, from the cases which I have collected, and of which I shall give a detailed account.

Neuroma does not appear to be confined to any particular age, or to either sex ; it is more frequently met with, however, at an early than at an advanced period of life. Of twenty-four cases, the age is mentioned in sixteen, and of these the youngest patient was twenty years of age, and the oldest seventy-three ; four were above forty-six, and twelve below it. It occurs more frequently in males than in females ; in fifteen cases the patients were men, in six women, and in three the sex is not mentioned.

The tumour is sometimes round, but more frequently it assumes an elliptical form ; it varies in size in different individuals, and at different periods of its progress. In some cases it has been found not larger than a pea or bean ; in others, on the contrary, its extent has been so great as to occupy the whole fore-arm, from the wrist to the elbow joint ; but it is not often allowed to attain so large a size,

* *Dissertatio Medico-Chirurgica de Tumoribus Nervorum.* Fredericus [Sigismundus] Alexander. Lugduni Batavorum, 1810.—*Dissertation sur les Affections Locales des Nerfs.* Pierre-Jules Descot, Docteur en Medecine, &c. A Paris, 1825.

as, in modern times at least, it has generally become the object of surgical practice, before it has made so great progress. The general size is from that of a pigeon's to that of a large hen's egg; but it is occasionally considerably larger. There is seldom more than one tumour present at the same time; in some rare cases, however, more have been found; and, in some of these, there seems to have existed a general disposition in the nervous system to the formation of morbid enlargements.

The disease is generally met with in the course of the trunks, or of the larger branches, of the nerves of the extremities,—more particularly of the upper,—and in the neighbourhood of the elbow-joint. Occasionally it occurs in internal parts of the body, and, perhaps, if more frequent and more accurate examination was made by dissection, this disease would be more frequently found to be the cause of many anomalous symptoms. In sixteen cases the tumour was seated in the upper, and in five in the under extremities; in one in the neck; in one within the cavity of the thorax; and in one in many parts of the body.

When once formed, the tumour increases rapidly, in spite of the application of remedies, and generally attains a considerable size in the course of a very few years; it ought, therefore, to be made the subject of operation, at an early period of its progress, when the circumstances are all more favourable for obtaining a perfect cure, than afterwards.

When the affected part is examined in the living body, the tumour is found to be seated under the skin, which is moveable over it; and, in almost every case, retains its natural structure and appearance, with the exception of an increase in the size of the cutaneous vessels, particularly of the veins, when the tumour is large; in one case it is reported to have been of a purplish or livid colour. The tumour itself is extremely hard, and generally firm to the touch; occasionally it is somewhat elastic; it admits of motion to a certain degree, but principally in a lateral direction, or from the surface inwards, or *vice versa*, but hardly allows of being moved at all upwards or downwards, in the direction of the nerve. It is extremely painful upon even the slightest pressure, and the pain generally extends to the parts supplied by the nerve; so much is this the case, that the affected nerve may be occasionally ascertained, by observing what parts are pained when pressure is made upon the tumour. Thus, in several of the cases, in which the ulnar nerve was implicated in the disease, the pain was distinctly referred to the ring and little finger. Occasionally, when a smart blow is given to the diseased part, the pain is rapidly extended to different parts of the body, like a shock of electricity. In some cases there is not much pain or uneasiness when the limb is kept at rest; but, in others, there is a peculiar tickling or vermicular sensation in the parts near the tumour; in other cases, again, the patient experiences most excruciating

ating pain, altogether independent of, though much increased by pressure, in parts at a considerable distance from the tumour, but in the direction of the trunk or branches of the affected nerve. The powers of sensation, and of voluntary motion, in the parts supplied by the nerve, are, in general, wonderfully little impaired, unless by the severe pain which occurs in consequence of the pressure attending motion of the limb. Occasionally, however, there is a degree of prickling pain, alternating with numbness in the limb; and pains darting downwards in the direction of the nervous branches. Neuroma differs from painful subcutaneous tubercle, in not being accompanied with the well-marked paroxysms of pain, which take place, without any apparent cause, in the latter disease.

Neuroma has been known to arise from an injury, particularly from a bruise when the skin remained entire, and from puncture. There is a very interesting case recorded by Mr Denmark, surgeon to Haslar Hospital, in which a tumour of the radial nerve was formed, in consequence of a wound by a musket ball, part of which had been broken off, by its collision with the os brachii, and had been lodged in the nerve*. Most frequently, however, no particular cause can be assigned for the appearance of the tumour.

Neuroma may generally be distinguished from other tumours by the severity of the pain produced by pres-

* Medico-Chirurgical Transactions of London, vol. iv. p. 48.

sure ; by the pain extending, in the direction of the nerve, to the parts supplied by it ; by the tumour being seated in the course of a trunk or large branch of a nerve ; by its admitting of little or no motion in a longitudinal direction, and by severe pain being excited by the attempt ; and occasionally by lancinating or prickling pain, alternating with some degree of numbness of the parts ; and by the powers of sensation and motion of the limb being to a certain degree impaired. A difficulty sometimes occurs in distinguishing tumours, depending upon diseased alteration of structure of some of the parts in the immediate neighbourhood of a nerve, from those formed in its substance or sheath ; as, from the proximity of situation, the symptoms are often very much alike. The distinction may sometimes be made, by an accurate examination of the symptoms, more particularly by attending to the effects of pressure on the tumour in different positions of the limb. Pring gives the following very interesting detail of a case of this kind.

“ A woman, in wringing clothes, occasioned a strain of the elbow. A hard elastic tumour formed between the inner condyle of the humerus and the olecranon. The pain arising from this tumour was without intermission, it extended up the arm, and reached the neck ; and it prevented effectually the motions of the joint. Any degree of pressure produced an augmentation of the pain, which passed up the arm, and extended down the fore-arm, affecting particularly the two last fingers.

“ It was directed, that the skin covering the tumour should be blistered, which was done without any apparent benefit. Tar ointment was next rubbed upon it, under which treatment a considerable reduction took place. About this time I first had an opportunity of seeing the woman : the swelling was not larger than a filbert ; the joint had in great measure recovered its freedom of motion, but a slight degree of pressure was still productive of pain.

“ When the forearm was bent, I could easily pass the tumour over the projection of the condyle ; it was not, *when in this situation*, susceptible of pain by any degree of pressure. The locality of the disease was thus identified ; for if the tumour had been formed in the substance of the nerve, as was suspected, the same degree of pressure would certainly have produced an equal degree of pain, whatever situation it might be made to assume. Indeed, the pain would most probably have been much greater, if the tumour was displaced, and compressed upon the condyle, than when treated in the same way in its natural situation. I believe that the direction of the pressure and its consequent effects will always afford a criterion for distinguishing between tumours which are merely contiguous to nerves, and those which occupy their own structure. If pressure be made in such a direction as to remove the swelling from the course of the nerve, the effects of compression would thus be prevented ; but if the tumour were *in the nerve*, the same pressure, whatever the direction of it might be, would easily affect

the sensibility which peculiarly belongs to the structure, and which is augmented under this condition of disease.

My idea of the above case was, that an effusion had been produced by the injury of a bursa; that the irritation of continued labour had occasioned its enlargement; and that, having attained a certain size, it compressed and irritated the ulnar nerve; the phenomena of which pressure of course disappeared, when the bulk of the swelling was reduced*.”

A case in some respects similar, and not less interesting, is thus reported by Sir Everard Home. “A lady, between 50 and 60 years of age, had a tumour in the breast, which was considered to be of a cancerous nature; and, as the disease was not found to extend itself into the axilla, although one gland was enlarged in that direction, the whole of the disease was believed to be within the reach of extirpation; and the operation was performed by Mr Hunter. The parts healed very kindly, and there was a very fair prospect of the patient doing well; but, unfortunately, at the end of a year and a half, a gland in the arm-pit began to enlarge, and the pain attending its increase was more severe than any thing she had before felt, even the operation itself. It was not to be allayed by opium, and nothing

* A view of the relations of the Nervous System in Health and Disease, &c.” By Daniel Pring, Member of the Royal College of Surgeons, London, &c. 1815. P. 159.

could be more miserable than her existence. Under these circumstances I was consulted, and only one question was pressed upon me, whether this tumour was within the reach of being removed, without endangering her life? I had no difficulty in answering this question in the affirmative. The operation was accordingly performed. While dissecting out the tumour, a branch of a nerve was found lying before it, so much upon the stretch, that it became necessary to divide it, with a view to disengage the gland, and the patient immediately exclaimed, "You have done it, the pain is gone; cutting that chord has entirely relieved me." This dreadful pain never returned; but the disease had contaminated the parts beyond, and she fell a sacrifice to it in the course of two or three years.

"Previous to the operation, this intense pain was supposed to be entirely a symptom of the complaint*."

Tumours connected with the nerves, when carefully examined, after being removed from the body by operation, or after death, are found to exhibit very different appearances in different cases; the variety depending, in a great degree, probably, upon the original seat of the disease, and also upon the state of progress of the tumour. It is often difficult to determine, in what particular situation or texture the diseased action

* Observations on Cancer, by Everard Home, Esq. F. R. S., &c. London, 1805. P. 86.

had commenced. In some cases the morbid enlargement would appear to have begun in the cellular tissue in the proximity of the nerve, to which it had gradually extended ; so that, in its progress, the nerve and its coverings had become completely involved in the disease. Unless tumours, however, which commence in textures external to the sheath of the nerve, shall come to implicate the nerve itself, they should not be considered as cases of Neuroma.

More frequently, I believe, the diseased action in Neuroma, producing enlargement and alteration of structure, commences in the neurilema, forming the external sheath of the nerve, or its connecting cellular substance ; or, in the minute processes of the neurilema, which are sent off, from the general sheath, to form coverings for the different nervous fibres, or fasciculi of fibres, which, by their union, form the nerve.

Sometimes, though rarely, the diseased mass seems to consist almost entirely of a cyst containing a fluid ; as in the case operated on, and reported by Cheselden. At other times, it is in part solid, and in part fluid ; more frequently it is solid throughout. In one of the cases to be detailed, the tumour consisted almost entirely of a firm membranous cyst, containing a thick fluid ; in three it consisted partly of fluid, and partly of a solid substance, of greater or less consistency ; and, in twenty, it was entirely of a solid texture. The solid part assumes a different degree of consistence, and a different colour

and appearance, in different cases; and sometimes in different parts of the same tumour. In some instances, the whole mass is very firm and hard, of a whitish or yellowish colour, and of a fibro-cartilaginous appearance, very much like nerve, but harder, and rather more shining, resembling an enlarged ganglion.

The fibres run generally in a longitudinal direction, but are not always parallel; they seem to be to a certain degree serpentine, and are interlaced by transverse fibres, the interstices being filled up by the substance of the tumour. The fibrous structure is most apparent in the tumours when small. In other cases, one part of the mass is firm and solid, of a reddish colour, and steatomatous appearance; and in another part there are cells of a larger or smaller size, some empty, others containing either a fluid, or a softish medullary looking matter. Occasionally there is a number of small lobes distinct from each other, but closely pressed together, and all of them connected with the affected nerve. In almost all cases there is an appearance of a firm sac, more or less dense, of a shining appearance externally, not unlike tendon; it is generally thinner over the centre of the tumour than towards its extremities; and seems to be formed in part, or entirely, of diseased neurilema. In some cases the sac is loosely attached to the contained parts by thin cellular substance; in others it is firmly incorporated with them; and, sometimes it is attached to, or partially covered by, muscular fibres. The internal

surface of the cyst occasionally, particularly when it contains fluid, or soft medullary matter, is soft and pulpy, of considerable thickness, and has very much the appearance of a secreting surface.

The nerve itself is sometimes sound, immediately as it enters and comes out from the tumour; but more frequently it is more or less diseased, for some little distance both above and below, being thickened, and sometimes redder than natural, so as to exhibit an appearance of inflammation. The nerve can frequently be traced distinctly to the surface of the diseased part, where some of its fasciculi, being separated from each other, run into the substance of the tumour, in which, or in the sac, they seem to be lost; but unless the tumour be of very large size, a number of the nervous fasciculi, sometimes a good deal flattened, can be traced, in a perfect state of continuity, running over its surface, to be connected below with the trunk of the nerve, from whence they had arisen. When the tumour is very large, however, none of the nervous fibres can be traced from the trunk above to that below the tumour, there being, to all appearance, a total breach of continuity in the nervous fibres. It is in all probability to be ascribed to the circumstance of the disease affecting only a certain number of the fibres of the nerve, while others are left in a healthy state, although in contact with the tumour, that we are to explain the fact, which seems to have puzzled some of the observers of the disease, that, in many instances, the powers of sensation, and of voluntary

motion, remain very entire in the limb, beyond the tumour. That part of the nerve does remain in a state fit for the performance of its functions, when another part is much diseased, is proved by the effect of dividing the nervous trunk in the operation for the removal of the tumour; when the sensation and power of motion of the limb, which had previously been little impaired, became instantly destroyed, or much diminished. From the appearance of the internal structure of some of the tumours, they have been supposed to partake of the nature of true scirrhus; but without entering at all into the discussion in regard to the occurrence of cancer, in nerves, as a primary affection, I may state, that there is at least very great reason to doubt of the tumours in Neuroma ever being of a truly scirrhus character: first, because however large the diseased mass is, or however long it may have existed, the contiguous textures, and more particularly the skin, do not become affected with disease of a malignant kind; and, secondly, because there seems to be no tendency to a return of the complaint, after it has once been removed by operation.

Schiffner, in a very minute examination, which he made by dissection of the bodies of two brothers who had been afflicted with Cretinism, found a great many hard tumours or tubercles, of the size of a pea, in a number of the nerves of various parts of the body; these, he observes, differ from painful subcutaneous tubercles in not giving rise to the paroxysms of severe pain which characterise that disease.

It is to be remarked, however, that appearances very similar to those described by Schiffner, were found in different parts of the body of a man, who had not been affected with Cretinism; these will be detailed in a subsequent part of this communication; the preparation exhibiting the tubercles, is in the university collection of Wurtzburg.

As in some degree connected with Neuroma, it may not be considered out of place to take some notice of the small hard tumours or tubercles, which form frequently, if not always, to a greater or less extent, at or near the extremities of nerves, divided in experiments or in operations, more particularly in amputation of the extremities, and which give rise to severe pain when pressed upon. There is a preparation in the Museum of the Royal College of Surgeons here, originally belonging to the collection of Mr Charles Bell, which exhibits these tumours at the extremities of nerves divided in amputation*. There are several preparations also in the Museum of Mr Langstaff of London, taken from stumps, in which tubercles are found at different distances from the cut extremities, the distance varying from one to three inches. The celebrated Meckel gives the following very accurate and interesting account of the formation and progress of tubercles of this kind. "Les extrémités d'un nerf dont on a fait la section se

* These are represented in the Plate, fig. 3.

gonflent toujours en un tubercule plus ou moins considérable *. Ce tubercule a une couleur grisâtre ; il est souvent si solide et si dur que le scalpel s'émousse en le coupant, et fait entendre un bruit semblable à celui que produirait son action sur un cartilage. Le volume de ce tubercule est en raison directe de l'abondance du tissu cellulaire, et du temps qui s'est écoulé depuis la blessure. Non seulement il grossit avec le temps, mais encore il devient plus dur. Celui qui garnit l'extrémité supérieure est plus petit, mais aussi dur que l'inférieur. La portion du nerf située au-dessous de la section est flétrie ; elle a perdu la couleur qui la distinguait.

“ Dans les amputations, ce tubercule ne paraît pas se développer exactement à l'extrémité du nerf coupé ; du moins Van Horn † a-t-il trouvé, jusqu' à un pouce au-dessous de la plaie, les nerfs confondus avec les bourgeons charnus qui naissent des muscles, sans qu'on pût les distinguer de la masse. Un mois encore après l'opération, ils étaient rougeâtres, tant en dehors qu'en dedans, et le tubercule, qui se distinguait de l'extrémité du nerf par sa couleur blanche, se trouvait situé plus haut encore. L'extrémité inférieure des nerfs se détruit donc plus ou moins, comme celle de tous les autres organes.

* Arnemann, Ueber die Reproduction der Nerven, Goettingue, 1786. P. 48. Id: Versuche über die Regeneration der Nerven, Gottingue, 1787.

† De iis quæ in partibus membri, præsertim osseis, amputatione vulneratis notanda sunt, Leyde 1803. P. 33-35.

Du reste, on observe également les tubercules sur les grosses et sur les petites branches nerveuses, et ils paraissent persister pendant toute la vie*.”

Descot says, “ Il se forme, à l'extrémité de chaque nerf coupé dans l'amputation, un tubercule ovoïde, trois ou quatre fois plus volumineux que le nerf, de la même couleur que lui, d'une consistance très-fèrme, et dont la texture, très-différente de celle du nerf, ne présente qu'un tissu fibro-cellulaire, dans lequel se perdent, en s'amincissant, les filamens nerveux, sans qu'on puisse les suivre d'une manière distincte jusqu'à son extrémité. †” He adds in a note, “ M. Breschet a observé aussi que ces tubercules ne formaient pas précisément l'extrémité du nerf, et qu'au dessous il existait un cordon fibreux qui se rendait dans le tissu de la cicatrice où l'amputation avait été pratiquée.”

It has been found in experiments made upon animals, by tying the nerves ; and also upon examination of the effects resulting from nerves being included in ligatures applied to the bloodvessels, in surgical operations, that a swelling or tubercle forms in a nerve, above the part to which a ligature has been applied. Descot says, “ La ligature appliquée à un nerf determine bientôt au-dessus, au-dessous et autour d'elle une effusion de matière coagulable, et particulièrement un gonflement ovoïde dans le bout supé-

* Manuel d'Anatomie Generale, Descriptive et Pathologique, par T. F. Meckel, tom. i. p. 282.

† P. 45.

rieur. C'est à tort que Bidloo et quelques autres disent, que le gonflement existe principalement au-dessous de la ligature : ce gonflement, déjà très-apparent au bout de quelques jours, devient ensuite vasculaire. Le gonflement des parties environnantes se résout peu-à-peu et complètement ; celui du nerf, au contraire, persiste, et principalement au-dessus de la ligature. Ce gonflement a été retrouvé même au bout de trente ans, dans le nerf médian, qui avait été lié avec l'artère brachiale*."

Portal has the following observations upon this subject. " L'une des branches du nerf sciatique peut être comprise dans la ligature des vaisseaux sanguins qu'on pratique après l'amputation de la cuisse : alors le malade éprouve souvent, immédiatement après cette opération, des douleurs très-vives, qu'il rapporte ordinairement au bout du pied, qu'il n'a plus. J'ai vu à *Montpellier*, dans le cabinet de *Lamorier*, célèbre chirurgien, un gonflement considérable au-dessus de la portion d'une branche du nerf sciatique, qui avait été comprise dans la ligature des vaisseaux cruraux après l'amputation de la cuisse. Le malade avait souffert pendant plus de deux ans, d'horribles douleurs, qu'il rapportoit toujours au bout du pied, qu'il n'avait plus. Le chirurgien *Lamorier* crut, après sa mort, en devoir rechercher la cause par l'ouverture du corps, et il trouva le gonflement et l'induration du nerf dont nous venons de parler †."

* P. 110.

† Cours d'Anatomie Médicale par Antoine Portal. Paris 1804. P. 289.

Soemmering has, with great appearance of truth, attributed these pains to the existence of the small tubercles above described. It has been asked, however, by Dèscot, whether they may not arise from the fibrous cord observed by Breschet, running from the tubercle to the cellular tissue of the cicatrix.

In regard to the treatment of Neuroma, it has been satisfactorily ascertained, that when the tumour is formed, it goes on increasing in size; and generally gives rise to increased suffering, in spite of any remedies, either general or local, which can be employed, and that these sufferings hardly admit of alleviation by medicine. It is highly desirable, therefore, that an operation should be had recourse to, as soon as the real nature of the disease has been ascertained; as all the circumstances are much more favourable for the accomplishment of a perfect cure when the tumour is small in size, and has formed no extensive connexions with the surrounding parts, than afterwards.

A difficulty is occasionally experienced in determining upon the nature of the operation which should be had recourse to; as, in some cases, it has been found possible to remove the tumour alone, after being dissected out of its cyst; in others it has been found necessary to remove the tumour along with the cyst, by the division of the affected nerve, above and below the diseased part; and occasionally amputation has been required. This point must be determined very much by the situation and size of

the tumour; by the nature of its connexions; and by the size of the affected nerve. Where the tumour is not extremely large, nor connected with large bloodvessels, or nerves essentially necessary for the sensation and power of motion of the affected limb, the nerve should be divided above and below the diseased part, and the tumour removed with the cyst entire; care being taken that the nerve be divided at its upper part first, and as early in the operation as possible; by which means, the pain of the operation, which is often very severe, is considerably diminished. This is an operation which has been proved to be a perfectly safe one, and has often been practised with complete success. When the tumour occurs in the hand, arm, or fore-arm, which are by far the most frequent seats of the disease, some temporary inconvenience has been found to result from the destruction of the nerve, in the loss or the diminution of sensation, and the power of motion in particular parts; but this does not take place to a great extent, nor is it permanent, as a gradual and progressive improvement generally begins to take place soon after the operation; and, in many of the cases, the whole powers were recovered; in the others, to so great an extent, as to leave a very useful limb. In only one case has an operation been reported to have been performed for Neuroroma in the axilla. In this case, no bad effects resulted as to the use of the arm or hand; the patient died; but the tumour was removed from its cyst by a tedious dissection; and the death may perhaps be

ascribed more to the general constitutional affection caused by the inflammation excited amongst the important parts seated in the axilla, than from any thing peculiar in the nervous connexion of the tumour. It is worthy of consideration, at least, how far the result might have been different, if it had been possible to have removed the tumour, along with its cyst, by the more simple operation of dividing the affected nerve in two places.

There is only one case with which I am acquainted, in which an operation was performed for a nervous tumour in the ham; in this, from its size and connexions, it was deemed advisable to remove the limb. It remains a question, however, how far it might be right to attempt to save the limb, in a case of Neuroma in the ham, where the tibial or fibular nerve alone is affected, and where the tumour could be wholly removed by the division of one nerve, the other and the bloodvessels being left entire. The operation would, in all probability, be a tedious and difficult one. It may be here remarked, that, in both of the cases in which the disease existed in the ham, the tibial nerve alone seemed to be affected, and the fibular to be sound.

There can be no doubt, I conceive, of the propriety of removing the tumour when seated in the foot or leg, or in the hand, arm or fore-arm; and it may be more safely done by bringing away the tumour along with the cyst, by cutting the nerve in the sound part above and below, with as little disturbance as possible to the surrounding parts, than

by dissecting out the tumour from its cyst, even when that can be done. When the disease, however, has been allowed to attain a very large size, so as to occupy great part of a limb, and to involve, to a great extent, the parts contiguous to the nerve, it appears to be a more safe practice to remove the limb.

It is not probable that any attempt will be made, in the present days, to cure Neuroma by making an incision into the diseased parts, for the purpose of causing their destruction by suppuration; as in the only case in which this was attempted, no advantage whatever resulted from the operation, which was an extremely painful one; and, even if the patient had continued to live, there was no probability of the wished for effect being produced. If the whole of the morbid parts cannot be removed with safety, it is far better to have recourse at once to amputation of the limb.

In looking into the twenty-four cases of well-marked Neuroma, which I have been successful in collecting, I find they give the following general results. In eight cases the operation of excision was performed with success. In two, the patients died after this operation; it is to be remarked, however, that in one of them the patient was 73 years of age, and at the time in an unfavourable state of health for undergoing any operation. In four, amputation was successfully performed. In three, no operation was had recourse to. In three, the tumours were accidentally met with in dissection. In two, the

disease was seated in internal parts of the body. In one, the tumour was laid open, with the view of bringing on suppuration; in this case the patient died, it is said of intermittent fever of the quotidian form, twelve days after the operation. In one the disease was cured by the destruction of the nerve by the application of caustic.

I shall now proceed to give an account of the cases which I have collected. I am afraid that the detail may appear tedious; but I find it impossible to give any abstract of them, without incurring the risk of doing injustice to the medical men by whom they were treated, or are reported.

Cheselden is the first author, who, so far as I know, has given a distinct account of the disease. There is a representation in his work of a nervous tumour, of which he gives the following description:

CASE I.—“A tumour formed in the centre of the cubital nerve, a little above the bend of the arm; it was of the cystic kind, but contained a transparent jelly; the filaments of the nerve were divided, and ran over its surface. This tumour occasioned a great numbness in all the parts that nerve leads to, and excessive pain upon the least touch or motion. This operation was done but a few weeks since; the pain is entirely ceased; the numbness a little increased; and the limb, as yet, not wasted*.”

* Anatomy of the Human Body, by W. Cheselden, 10th edit. Lond. 1773, p. 256.

The next case is taken from the *Encyclopedie Methodique de Chirurgie*.

CASE II.—“ Une Demoiselle, de vingt deux ans, portoit sur la partie interne de l'avant-bras, une tumeur, qui avoit commencé quatorze ans auparavant, par une petite dureté, située à-peu-pres à egale distance du pli du coude et du poignet, et qui paroissoit avoir son siege sur le ligament interosseux. Aucune cause manifeste n'avoit donné naissance à cette affection, que l'on crut cependant pouvoir attribuer à une chute, qu'avoit faite la malade quelque tems auparavant. La tumeur fit des progrès, malgré des tentatives sans nombre pour la dissiper, et son volume ne cessa jamais de s'accroître dans toute sa dimension. On avoit consulté de tous cotés les praticiens les plus distingués; on s'etoit aussi adressé à des charlatans, un de ceux-ci eut la hardiesse d'appliquer sur le mal un caustique par lequel il pretendoit avoir guéri beaucoup de tumeurs: mais, lorsqu'il eut fait une playe aux tegumens, on vit qu'il avoit mis à decouvert une partie des muscles et des tendons de l'avant-bras, et on ne lui permit d'aller plus avant. On fit sur la playe les applications convenables, et elle se cicatrisa plus heureusement qu'on n'avoit osé l'espérer.

Après avoir inutilement tenté une multitude de remèdes, on renonça absolument à en faire de nouveaux: on se flattoit que la tumeur cesseroit enfin de prendre de l'accroissement; et comme la malade se servoit toujours de son bras malgré le poids enorme qu'il avoit acquis, on écartoit l'idée de l'amputation, à laquelle néanmoins on sentoit que l'on seroit probablement obligé, tot ou tard, d'avoir recours. La tumeur n'etoit pas douloureuse habituellement: mais la malade y eprouvoit des douleurs lancinantes, qui se faisoient sentir particulièrement aux deux extrémités, et sur-tout inferieure; ces douleurs devenoient avec le tems toujours plus fréquentes, et plus vives. Enfin le volume de la tumeur s'étant accru au point qu'elle occupoit tout l'avant-bras depuis le coude jusqu'au carpe, et qu'elle avoit au moins six pouces de diametre dans son milieu, sa surface lisse et uniforme devenant un peu plus inégale, sa dureté jusque la paroissant diminuer dans quelques points, et les elancemens douloureux augmentant en fre-

quence et en intensité, la malade vint à Paris, ou, d'après l'avis unanime de plusieurs personnes de l'art, elle se soumit à l'amputation du bras, qui fut faite à quatre pouces environ au-dessus du coude. L'opération, faite par le célèbre Louis, fut suivie du plus heureux succès, et la malade acquit bientôt après un degré de santé dont elle n'avoit pas joui depuis bien des années.

Après l'opération, on examina la tumeur, on la trouva partout environnée sous les tegumens par les muscles qui formoient autour d'elle comme un fourreau, et sous les muscles par un kyste particulier formé par une membrane très-fine, et demi-transparente ; sur laquelle on voyoit un grand nombre de vaisseaux lymphatiques très-considérables. Les vaisseaux sanguins de la partie, et particulièrement les veins cutanées, étoient aussi excessivement dilatés. A l'ouverture du kyste, la tumeur parut se diviser en plusieurs masses plus ou moins considérables, enveloppées chacune en particulier par une membrane de la même nature que celle qui enveloppoit la totalité. Chacun de ces masses étoit composée de plusieurs lobes fortement serrés les uns contre les autres, la plupart d'une forme vermiculaire et de la grosseur du doigt, ou à-peu-près, variant beaucoup entr'elles pour la longueur. Chacune de ces lobes avoit un pedicule très-délié, qui étoit une branche du nerf radial autour duquel ils étoient tous fixés à-peu-pres comme de raisins le sont à la grappe. La substance de ces lobes ferme et compacte, homogène, jaunâtre, un peu transparente, paroissoit formée presque en entier par la lymphe coagulable : on ne pouvoit y appercevoir aucune organisation.

Telle étoit surtout la partie supérieure de la tumeur ; la partie inférieure, c'est-à-dire depuis le milieu à-peu-près de l'avant-bras, jusqu'au poignet, étoit un peu différente ; on y voyoit le tronc même du nerf radial affecté dans son entier ; en sorte que ses fibres, qui dans l'état naturel s'avancent parallèlement vers la main, étoient séparées les unes des autres, excessivement épaissies jusqu'au ligament annulaire du carpe, et reprenoient, en cet endroit, leur apparence naturelle pour former le nerf qui s'avance sous l'aponéurose palmaire. La matière de la tumeur étoit d'ailleurs la même dans toute son étendue, si ce n'est qu'en plusieurs points

elle paroissoit un peu plus rouge, moins dure, et sembloit avoir contracté un degré d'inflammation.

On ne trouve, nulle part que je sache la description d'une tumeur pareille formée uniquement par le gonflement d'un nerf, toutes les parties environnantes étant d'ailleurs dans un état très-sain. C'étoit une chose assez étonnante qu'une affection pareille du nerf radial, n'en eut point altéré les fonctions, la malade s'étant toujours servie de sa main autant que l'embarras, résultant du volume de la tumeur, le lui avoit permis; cette main étoit, il est vrai, un peu plus petite, que l'autre, mais elle n'avoit rien perdu quant à la sensibilité, et au mouvement des doigts. Cette circonstance conduisit à supposer que le nerf n'étoit pas affecté dans sa substance même; mais seulement dans ses enveloppes, supposition que toute la dextérité du savant anatomiste M. Pelletan, chargé de la dissection du bras, ne peut point confirmer. Si l'on peut se former d'avance une idée de la nature de la tumeur, et sur tout si l'on eut pu juger qu'elle étoit parfaitement enkystée, peut-être auroit on tenté de l'enlever par la dissection, et de sauver ainsi le bras; mais outre qu'on ne pouvoit avoir aucune notion, à cet égard capable de diriger le chirurgien, on auroit tout lieu de craindre que cette opération ne fut sans succès, soit à cause de la vaste étendue de la playe qu'on auroit été obligé de faire, soit à raison de la destruction du nerf principal de l'avant-bras, dont les fonctions n'eussent probablement été que difficilement suppliées par le nerf cubital, et les autres branches que se rendent à cette partie*."

The two following cases are detailed by Sir Everard Home.

CASE III.—“A lady, 20 years of age, had a tumour on the outside of the biceps muscle of the right arm, just below the middle. It was of the size of a small pullet's egg, of an elliptical form, and moveable in the surrounding parts, but principally in a lateral direction. It was extremely painful when any thing pressed against

* Encyclopedie Methodique Chirurg. Par de La Roche et Petit Radel. Paris 1792. Tom. ii. p. 442.

it, which made her very careful in defending it from external accident. It had been several years in arriving at this size, but was now increasing more rapidly, which induced her to submit to have it removed.

“ The operation was performed by Mr Hunter, in which I assisted him. In the operation, handling the tumour, or removing it from its place, gave the most excruciating pain. When the tumour was fully exposed, it had a smooth, shining, external surface, and terminated at its *upper and lower* ends in a strong white cord, which proved to be the musculo-cutaneous nerve. Upon cutting into the tumour, it was discovered to be inclosed in the nerve. This discovery was not made till the tumour had been every where laterally dissected from the surrounding parts. It was therefore thought prudent to remove the whole, by dividing the nerve at the two ends of the tumour. The artery belonging to the nerve bled so freely, that it became necessary to apply a ligature on both the cut ends of the nerve, as the artery itself could not be got at. An attempt was made to heal the wound by the first intention, which did not succeed; but it got well as soon as wounds of that size usually do, by suppuration and granulation. The patient lost the use of her forefinger and thumb, and there was a numbness in all the parts supplied by that nerve. The skin which covered them was unusually rough and dry, and the cuticle came off in small scales. Before the operation, the pain was not confined to the tumour, but extended to all these parts. On examining the tumour, it was found that three inches in length of the nerve had been removed; that it was divided into two portions, each of them very much flattened, and passing over two opposite sides of the tumour. There was also a nervous expansion not thicker than a common membrane, which completely invested the whole of the tumour; and when that was divided, it could be readily separated every where, except at the *extremities*, where the connection was somewhat stronger.

“ When the tumour was divided, and the cut surface accurately examined, it had the appearance, in the centre, of serpentine ner-

vous fibres running in the course of the nerve. These were separated from each other, and the interstices filled up with the substance of the tumour; but that part of the tumour which was exterior to these fibres had something of a radiated structure."

CASE IV.—“Peter Coillot, a Frenchman, 35 years of age, was admitted a patient under my care, in St George's Hospital, July 13, 1796, with a tumour, *which was situate in the middle of the hollow between the two folds of the armpit.* When the arm was hanging down, it projected very little; but when the arm was raised, it became very prominent, that position of the parts bringing the tumour forward. It admitted of lateral motion, which was, however, very confined, being just sufficient to ascertain that it had no firm connection with the parts behind.

“The first symptom which he felt was a darting pain in the fingers of that hand. This came on in July 1795, and increased from that time; but the tumour in the armpit was not discovered till June 1796, and was then as large as a small pullet's egg. When he came into the Hospital, it was more than double that size. The pain he felt in the tumour and in the arm was very severe. This was very much increased by any pressure against the tumour.

“Its relative situation to the great nerves and bloodvessels, its obscure motion, and the uncommon degree of pain which it occasioned, were unfavourable circumstances for an operation. I was therefore induced to try a variety of means to relieve the symptoms, but these proving ineffectual, and the pain becoming worse, the removal of the tumour seemed to be the only means left that could give him a chance of getting well. To this the man most cheerfully submitted, as he declared that his present sufferings were insupportable.

“During the operation, the arm was raised as high as possible, to bring the tumour fully into view. Upon dividing the skin and the cellular membrane, the first object which presented itself was the axillary vein stretched over the anterior surface of the tumour.

This was drawn to one side, and retained in that situation. When the tumour was laid bare, it was found to have a smooth external surface, and the end next to the arm terminated in a strong white cord. When this was pulled, it did not give pain in the part itself, but the arm felt overstretched, and gave him the greatest uneasiness. This circumstance brought to my recollection the case of the young lady above related, and led me to consider this to be similar to it. I therefore cut through the external covering of the tumour, which was only a thin membrane, and dissected off a considerable portion of it. This enabled me with the finger to detach the remainder of the tumour from its covering, and entirely to disengage it, upon which it was immediately expelled by the action of the surrounding muscles. No hæmorrhage ensued, and the parts were superficially dressed. The patient immediately after the operation felt relieved from the distressing symptoms he before complained of.

The tumour was of a yellowish-white colour, about three inches and a half long, two inches thick, and of an oval form. When cut through, it was found to consist of a whitish very firm substance; in the centre of which there was a very obscure fibrous structure; and towards the outer surface the texture was indistinctly radiated. The day after the operation, the patient was free from pain, and could move his fingers without uneasiness. He continued going on well till the fourth day, when he lost his appetite, had an unusual heat in his skin, and his *pulse exceeded its natural frequency*. On the fifth day he was nearly in the same state; on the sixth his pulse was *quick*, and had a sharpness in the stroke. His skin felt hotter than before, and he had a præternatural thirst; his spirits were depressed, and he felt persuaded that he should not recover. On the next day, in the forenoon, he died.

On examining the parts after death, the tumour was found to have been incased in one of the large nerves which form the axillary plexus: the principal substance of the nerve passed along the posterior surface of the tumour. There were also some other branches much flattened, and, as it were, imbedded in the ner-

vous expansion surrounding the tumour. The cyst was now much contracted, and more than four times thicker than at the time of the operation. *In consequence of having been inflamed*, the cavity was lined with coagulated lymph, and almost filled with coagulated blood, as suppuration had not completely taken place. The inflammation and swelling had extended some way into the surrounding parts, which were also consolidated into one mass, and with difficulty separated by dissection.

The other parts of the body were found in a natural state, so that there was no evident cause of death, but what arose from a considerable degree of inflammation, upon the substance of a large nerve, for three inches in length, which also affected the other nerves of the plexus.

A similar tumour had formed in one of the other nerves, but was much smaller in size. It lay directly between the axillary artery and the tumour which had been removed. In this situation, it prevented the pulsation of that artery from being felt during the time of the operation, which I was before at a loss to account for.

The structure of this tumour was exactly similar to that from the arm of the young lady, except that the nervous fibres in the centre were rather more distinctly seen, the spiral direction of the fibres being readily distinguished by the naked eye; *in other respects*, it was exactly the same. The want of distinctness in those of the larger tumour may therefore be reasonably supposed to be the effect of the increase of size by which they were rendered obscure*.

Odier, in describing Neuroma, says,

CASE V.—“ C'est heureusement une maladie rare ; mais j'en ai vu dans ma famille même un cas remarquable, qui m'a douloureusement occupé pendant bien des années, et dans lequel l'augmentation graduelle du mal, malgré un nombre infini de consultations et de remèdes, a enfin nécessité l'amputation du bras.

* Transactions of a Society for the Improvement of Medical and Surgical Knowledge, vol. ii. p. 152. London, 1800.

A l'ouverture, la tumeur se trouva être une espèce d'aneurisme du nerf radial, dont tous les filets, étoient écartés les uns des autres à l'extérieur en forme d'éventail, ou comme les côtes d'un melon ; tandis que le centre étoit rempli d'une matière blanchâtre, qui en quelques endroits avoit un peu jauni, et qui étoit épanchée dans les intervalles d'un nombre infini de vaisseaux transparens entrelacés les uns dans les autres. C'est communement au poignet que se forment ces tumeurs *."

CASE VI.—Dr Spangenberg had an opportunity of examining a tumour of this kind, of the size of a small walnut, which M. Dubois had extirpated in his presence from the knee-pan of a lady. After he had cleared away the cellular membrane and fat from the tumour, he saw the cutaneous nerve run out from the middle of it, upwards and downwards. In order to see if there might not be a gelatinous exudation or nervous accumulation in the nervous membrane, as was seen by Boërhaave, Morgagni and others, he divided the swelling longitudinally down to the middle ; but it remained hard and compact as before, and, on pressure, no drop of moisture exuded from it. He then divided it longitudinally into two equal parts ; one of these he laid in soap-boilers' leys ; after fourteen hours he washed it in water, and pressed out the medulla, without its having any perceptible influence on its size, consistence, and weight. The other portion was left lying for seven days in weak nitric acid, in which it soon shrunk up ; on its being washed in water, nothing but the hardened medulla remained behind, which was scarcely a twentieth part of its former size. This swelling, therefore, Dr Spangenberg concludes, depends on thickening of the membranes of the nerves.

The following case Dr Spangenberg extracted from Dubois's Journal :

* Manuel de Medecine-Pratique, &c. par Louis Odier. Docteur et Prof. en Medecine, &c. 2de edition, p. 362.

† Horne's Archiv. 1804. Band v. s. 309.

CASE VII.—“The inspector of mail-coaches at Paris had, for about a year, on his right arm a compact, firm swelling, of the size of a small melon, which began immediately under the elbow-joint, and extended to the root of the hand in the course of the median nerve of the arm; above it was broad, but it became gradually smaller below, and, when the arm was slightly bent, it possessed a considerable degree of mobility. The skin was not discoloured, nor tight, but rather loose. M. Dubois made a longitudinal incision along the whole tumour, extended it upwards and downwards, and obtained the necessary space by a crucial incision on both sides. The tumour had pushed the muscles somewhat to the side, and lay partly uncovered. The whole tumour was dissected out, without any considerable loss of blood; and the healthy ends of the median nerve divided above and below. The wound healed in about three weeks. The patient sustained no other injury from the operation, than that he lost sensibility on both sides of the finger. In other respects he could use his arm as before.” “The character of the tumour,” adds Dr Spangenberg, “was, from Dubois’s oral description, similar to the one which I myself examined*.”

CASE VIII.—In the Anatomical Museum of the University of Wurzburg, there has been prepared and preserved, by the care of Dr Hesselbach, Prosector at the Anatomical Theatre, a pretty considerable tumour, more than an inch in its greatest diameter, attached to the ulnar nerve, which was found in the body of a day-labourer. It is of the size of a small apple, and somewhat flat; it lay between the Aponeurosis palmaris, the M. palmaris brevis, and between the muscles of the little finger, to which it was strongly attached. The exact seat of this swelling is in the cellular membrane of that twig of the ulnar nerve which goes to the little finger. On being divided longitudinally, it was found to bear a considerable resemblance in substance and colour to the ovaria. At one place, in particular, a number of small cells are observed,

* Horn's Archiv. 1804. Band v. s. 311.

which are very similar to the vesicles or ovula in the ovaria. Some of these are hollow, others are filled with a clear yellow firmish substance; immediately around these cells there lies a brownish, and next again a greyish ring, which is then lost in the rest of the substance. The nerve, as it enters, becomes gradually flatter, broader and thicker, and is, at last, lost on the upper surface of the swelling, forming a groove-like angle at its entrance into it. The swelling on several parts of its upper surface is wrinkled, and has a white, shining and smooth appearance*."

Dr Alexander is the first writer who has given a full and accurate general history of nervous tumours; he has quoted a number of cases recorded by former authors, and has added the two following original ones:

CASE IX.—“ T. Siegel annum agens undevicesimum, cohortis octavae miles, habitu et conditione corporis satis bonâ gaudens, at infantile ætate affectione scrophulosâ vexatus, die 10. Februarii 1804 Nosocomium Militare Leidense ingreditur, febre laborans intermittente. Hac sanâtâ propullavit scabies, glandulæque in variis corporis partibus observabantur tumescentes. Adhibitâ mendendi ratione aptâ, mense Julii ad pristinam rediit sanitatem.

“ Querebatur interea de tumore ipsi molestissimo, quem inde a sexennio in brachio sinistro gerebat. Post pulsam ægritudinem corporis universalem, opportunum demum censuit Reichius V. Doctiss. mali illius localis et chronici, quod cum præcedenti morbo nexum nullum habebat, curam esse suscipiendam.

“ Retulit æger, tumorem hunc in facie inferiori atque interna brachii sinistri, haud longe ab antibrachii articulatione in viciniis arteriæ brachialis, nunc voluminis et formæ ovi gallinacei conspicuum, ante hos sex annos primum propullulasse, magnitudinis eo tempore pisi, illum inde in hunc usque diem sensim mole fuisse ad-auctum, se autem causam mali occasionalem ignorare.

“ Tumor cæterum cute sanâ et mobili tectus erat, elasticus, ad

* Siebold's Beobachtungen. Band i. s. 82.

minimam pressionem resiliens, liquore turgere videbatur; in utrumque latus nonnihil poterat moveri, at nec in superiora nec in inferiora cedebat. Sibi relictus, et ab omni pressione liberatus, vix ab ægro percipiebatur, qui ex minimâ pressione aut qualicumque externâ injuriâ in illum illatâ dolore immani afficiebatur. Malum jam ab initio admodum fuisse sensile, at vero sensilitatem cum volumine continuo incrementa cepisse narravit.

“ Doloris sensus juxta decursum nervi cubitalis, imprimis se extendebat in inferiora versus digitum annularem et minimum. Dolor cum non admodum vehemens esset, vel etiam si hic modo vehementissimus sensim cessaret, in memoratis digitis de titillatione, vel motu quasi vermiculari, æger querebatur. Nullorum musculorum motus erat læsus, omnes digiti facile et libere movebantur, calor etiam in toto brachio et manu erat naturalis.

“ Vocatis a Reichio V. Doctiss. in consilium Pelugio et Sebastiano Collegis Doctiss., Chirurgis hujus Nosocomii quoque primariis, mihi quoque in disciplicâ medicâ præceptoribus exoptatissimis, huic consilio adesse quoque dignatus fuit Brugmansius V. Cl. rei medicæ militaris præfectus. Unanimi consensu habitus fuit tumor sedem occupare in ipso nervo cubitali, nullumque aliud superesse remedium præter illius extirpationem.

“ *Die* 8 Julii operationem instituit Reichius V. Doctiss. sequenti modo. Cute elevatâ in plicam transversalem instituta sectio est longitudinalis, longitudinis quinque pollicum, ut tumor ita nudatus ac integer coloris albi et superficiei nitentis in conspectum prodiret. A partibus vicinis fuit solutus, quo facto, licet plures arteriolæ abscinderentur, vix tamen alicujus momenti hæmorrhagia sequebatur.

“ Ita apparuit recte sese habuisse diagnosin; et revera tumorem in ipso nervo ulnari locum habere.

“ Sectione supra et infra locum tumentem factâ, universus tumor fuit ablati, ita ut pars nervi longitudinis quatuor pollicum separari debuerit.

“ Doloris admodum plena hæc operatio erat præ tumoris imprimis sensilitate, et ipsa nervi divisio dolorem ad gradum summum evehere videbatur; factâ scissione, non quidem dolor mox cessabat, sed minuebatur tamen, et quasi indole mutabatur, dum eodem tempore,

momento citius in totâ manu sensus, calor et motus voluntarius peribant.

“ Elapsis iude ab operatione aliquot horis, redibant hac in manu hæ movendi ac sentiendi facultates; solius autem digiti annularis facies externa, et totus digitis minimus insensiles, frigidi, nec ad voluntatis nutum mobiles manebant.

“ Absolutâ operatione, post purgatam a sanguine plagam, labia vulneris ad invicem adducebantur, fasciis emplastro adhæsivo obductis firmabantur, ac linteo carpto fasciâque in similibus casibus adhiberi solitâ muniebatur brachium.

“ Ob dolores perpressos opii parva dosis fuit adhibita. Febris consensualis vix ac ne vix quidem sequebatur, et symptomatibus systematis nervosi affecti liberatus æger mansit.

“ Secundâ ab operatione die, tumebat ex inflammatione, moderatâ tamen, omnis vulneris ambitus.

“ Fomentum ex aqua vegeto-minerali fuit adhibitum. Cum dolore lente minuta inflammatio fuit levisque secuta suppuratio.

“ Post paucos dies sensim sensimque sensus, motus et calor ad digitum annularem redibant, et post 14 ab operatione dies, etiam digitum annularem poterat movere æger, sed sensilitas in hoc digito minimo adhuc desiderabatur, quæque die sexto Septembris 1804, cum ex nosocomio dimitteretur sanatus, non nihil jamjam redierat, nondum tamen penitus restituta erat.

“ *Die 16.*—Bonâ cicatrice clausum erat vulnus, nullæque mali supererant reliquiæ, præter memoratam in digito minimo, minutam sensilitatem.

“ *Examen tumoris ablati.*—Tumor telâ cellulosâ adhærente caute liberatus, expansum ita nervum exhibuit, ut neurilema externum ejus involucri constituerit. Cubitalis nempe nervus, supra tumorem per longitudinem dimidii fere pollicis abscissus, visus fuit sanus ad locum dilatatum usque, quemadmodum sanus etiam apparuit mox infra tumorem, ad cujus partem infimam etiam pari longitudine dimidii pollicis fuit relictus.

“ Color tumoris idem ac nervi erat, tamen aliquantulum magis splendens. Cæteram vel oculo nudo fibræ distinguebantur longitudinales, interjectis paucis transversalibus. Ad tactum erat sub-

durus, elasticus, et fluidum intus latere nunc facilius quam antea sentiebatur.

“ Incisione in longitudinem factâ, exterior paries pariete nervi jam longe erat durior, consistentiæ quasi tendinosæ, vix tamen cartilagineæ.

“ Quam primum vulnusculum fuit inflictum ad interiora penetrans, liquor tenuis, limpidus, sero sanguinis satis similis, et seri instar etiam concrevens effluxit, ita quidem ut humore hoc per tunicæ externæ elasticitatem expresso, tumoris volumen tertia sui parte fuerit imminutum.

“ Dilatatâ per totam longitudinem aperturâ, tumoris paries exterior sese obtulit, ut continuatio neurilematis nervi sani. Eâ parte, quâ nervo erat proximus, hoc est, ad partem superiorem paries hic exterior tumoris admodum erat durus et crassior redditus quam ad nervum sanum esse solet. Versus medium autem tumoris, qua parte in amplissimam diametrum erat expansus, in tenuem membranam, at tamen egregie firmam extenuatus reperiebatur.

“ Ad faciem internam hujus parietis seu involucri ex neurilemate facti, oculo armato fibræ observabantur subtiliores, atque parallelæ.

“ Cavum interim, ratione memorata ex neurilemate formatum, lamina ab omni parte densa pulposa singulari ita tegebatur, ut ad medium seu centrum tumoris cavum superesset ovi adinstar oblongum, quo liquor serosus latuerat, et qui, aperturâ factâ, effluerat et in exteriora totum tumorem æquabiliter urserat.

“ Pulpa singularem meretur attentionem.

“ Non qualis in nervo sano est, hæc videbatur copia tantum et volumine aucta in tumorem continuare et a parte inferiori in nerveam pulpam sanam dein rursus contrahi; sed ad natum tumorem pulpa sana videbatur desinere, et limite facile observando posito, illa in tumore nova morbosaque facie induta conspiciebatur.

“ Hæc nimirum pulpa tunicæ tumoris externæ adhærens, ut dictum, crassitiem fere habebat dimidii pollicis, fibras obtulit rectas decurrentes et parallelas nullas, sed corpuscula rotundata, constantia et involuta quasi fibris convolutis, intestini-formibus, glomeratis, numerosissimis, proxime convenientibus cum illis, quæ Fontana

V. Cl. microscopii beneficio, in substantia nervorum medullari et corticali cerebri observavit et delineanda curavit.

“ Cum his corpusculis filisque conglomeratis circumvolutisque tota tumoris nostri pulpa proxime congruebat, hac cum differentia, quod oculus nudus, vel parum saltem armatus, accurate distingueret, quæ in nervo sano et cerebri cortice, Fontana demum microscopio objectorum longe magis amplitudinem augente, distinguere potuit.

“ Hæc omnia quæ fabricam hujus tumoris spectant, mecum a Brugmansio V. Cl., benigne communicata in præparato, quod ejusdem in musæo servatur, hoc ipso tempore (Ao. 1810) adhuc cernere est.”

CASE X.—Observatio secunda.

“ Vir nobilissimus G——, plena cæteroquin atque firma sanitate valens, constitutionis robustioris, nunc annum agens quadragesimum et quartum, ante 12 et quod excurrit annos, cubitum dextrum impetu adeo magno in acutum lapidem impegit, ut dolore acutissimo e contusione percepto, quasi fulminis ictu in terram percussus, aliquot horarum spatio sensuum usu privaretur.

“ Cum nemo adesset qui opem ferre posset, post aliquam moram ad se sponte rediit, dolorem sentiens in loco adfecto violentissimum. Chirurgus ad auxilium ferendum vocatus, levioris tantum contusionis indicia externa potuit detegere, nullam autem læsionem, quæ doloris magnitudini responderet.

“ Solitis remediis admotis, contusionis externæ noxa paucorum dierum spatio sublata fuit, superstite tamen doloris sensu acutissimo, quoties locus læsus tangebatur, cum tumore exiguo initio parum manifesto. Ab eo tempore tumor lente fuit auctus; et doloris sensus, quoties premebatur non fuit imminutus.

“ Interea æger præ tumoris sensilitate dextri brachii usu fere privatus, a multis chirurgis, quos inter illustriores plures erant, auxilium petiit. Externa medicamina præscripserunt indolis diversissimæ, quorum tamen nullum vel minimum attulit emolumentum. Adiit die 21 Maji 1809 Reichiam V. expertissimum, hujus auxilium petiturus.

Tumoris nunc ratio hæc erat. Hærebat tractu obliquo supra

cubitum dextrum ad condyli ossis humeri latus externum, longitudinis erat duorum pollicum, latitudinis fere dimidii, et ad trium linearum altitudinem e cutis eminebat superficie. Cutis imposita ad tumorem mobilis, coloris erat ex livido purpurascens.

“ Ingentis erat sensilitatis malum, ut vel ad levissimum attactum dolor acutissimus perciperetur, cujus sensum per universum corpus sese diffundentem, æger cum ictu electrico comparabat; cæterum si non premeretur vel allideretur quocunque modo, non quidem dolebat; attamen cum admodum esset difficile omnem evitare externam affectionem, creabat nihilominus insignem molestiam, ita ut vix ad usum posset vel auderet dextrum brachium vocare.

“ Doloris vehementia longe erat intensior, si a superioribus in inferiora, aut ab inferioribus in superiora chirurgus tumorem movere conaretur, quam si in alterutrum latus illum diduceret. In consilium vocabatur Brugmansius V. Cl. qui cum Reichio V. Doctiss. eandem fovebat opinionem, sedem morbi in affecto esse subcutaneo nervo, omnemque sanationis spem in extirpatione esse positam. Lubenter æger sese operationi subjecit. Ad minuendam interim sensilitatem non sine aliquo levamine per aliquot dies fomentatio, ad sequentem formulam præparata, adhibita fuit.

“ R Extract. Saturni ʒi

Opium puri ʒi

Aquæ Pluvial. ℥ij.—M.

“ Die 12 mensis Junii 1809, Reichius V. Doctiss. præsentibus Brugmansio V. Cl. et La Lau V. Doctiss. Med. Doctore, hac in urbe Praxin feliciter exercente, nonnullisque commilitonibus, quibus et interesse mihi contigit, operationem sequenti modo instituit.

“ Elevata in plicam transversalem ad tumorem communia integumenta, alterâ parte ab adjutore, alterâ parte ab operatore prehensa ad longitudinem tumoris incidebantur. Sectio in superiora et inferiora extendebatur, ut totus tumor, cum tela cellulosa copioso adipe granuloso farcta, propullularet. Nervi ramuli per hanc telam cellulosa sparsi, et in sacculos quasi per morbum dilatati, speriebantur facillime humoremque serosum effundebant.

“ Adiposa hæc lamina, una cum nervosis ramulis, per morbum affectis cultro auferebatur, ut ligamentum capsulare nudum spectaretur. Nullius momenti sequebatur hæmorrhagia, sed æger immanes dolores, singulari animi fortitudine perpessos, expertus fuit, donec ablatas fuerit tumor, quo facto sine molestia ulteriori mox digitis universa plaga tangi atque explorari potuerit. Mundato a sanguine coagulato vulnere, hujus labia sibi fuere admota et quinque striis ex emplastro adhæsivo firmata, spleniis, fascia denique atque ferulâ cubitus fuit ita sustentatus, ut brachium flecti non posset et situs horizontalis ipsi foret facilis.

“ Nulla febris consensualis, nec ullum aliud symptoma molestum est secutum.

“ Ad minuendam inflammationem tertio post operationem die, fomentatio fuit adhibita ex aqua vegeto-minerali, cujus usus per aliquot dies fuit protractus.

“ Octavo die dum nova applicabantur emplastra, jam cicatrice maximam partem vulnus erat firmatum.

“ Die decimo tertio ad partem inferiorem vulneris, exigua tantum supererat superficies nondum coalita. Huic Balsamus Peruvianus niger applicabatur, et post biduum clausa plaga erat.

“ Ne cicatrix nondum satis firmata violentiori motu iterum disjungeretur, pedetentim ac debitâ sub cautela, ut brachium moveret ac flecteret, ægrotanti fuit concessum.

“ Post paucas hebdomades quosvis perficere potuit sine ullâ molestiâ aut dolore, brachii motus, et post elapsos decem menses (dum hæc scribo) nullus amplius vel de præcedenti malo, vel de operatione superest sensus.

“ Cum sedes morbi in tenuissimis esset ramulis nerveis subcutaneis, examini anatomico tali accurato tumor se non præbuit, quali occasionem dederat ille, de quo in observatione præcedenti dictum fuit.

“ Constitit tamen satis, fibrillas nerveas dilatatas ac locotumente liquore seroso repletas, externam tunicam exhibuisse induratum, qua aperta, cum nunc liquor ille effluerit, tractus duriore, et quasi tendinosi superstites conspiciuntur*.”

* “Dissertatio Medico-Chirurgica de Tumoribus Nervorum, Fredericus Sigismundus Alexander. Lugduni Batavorum 1810.”

In the Museum of the Royal College of Surgeons here, there is a very valuable preparation of Neuroma which occurred in the ham. Mr. Charles Bell, who preserved the parts, has given the following very interesting history of the disease; and there is an engraving of the diseased parts in his work upon Operative Surgery.

CASE XI.—“ About three years before I saw the subject of the following case, he had fallen from the side of a ship. It happened in this way. Seeing his fellow workman falling, he threw himself forward to break his fall, and succeeded, but in doing this he fell himself; for he was caught by the ham on a projecting bolt in the side of the ship over which he turned, and hung suspended. He suffered much from the bruise on the back of the thigh, but in a short time it got entirely well.

“ Some time after this he began to be much troubled with a pain in the foot. This pain was in a part not likely to procure him much sympathy; and he suffered much and long without attempting to procure assistance, or only such as the extremity of pain will put a man upon for the time.

“ But the pain continued to increase from day to day, until it totally unfitted him for labour, exhausting and wasting his frame by continued watching. This pain was of a peculiar kind; it was confined to the bottom of the foot, and was like an intense burning, while there was not the slightest discoloration or swelling in the place. Often he would rise at night from his bed and stand on the cold stones, or plunge his foot into warm water or cold water, or into both alternately.

“ He now sought relief in a public hospital, and the attendants there, disconcerted with the strangeness of the symptom, which they did not comprehend, put him, as is usual on such occasions, on a course of mercury; but this trial of medicine did no good, and he went home. But, still suffering continually, he was induced, after a lapse of some months, to return to the hospital, and was again put on a more severe and a longer continued course of mercury than at first. By the time this was over he had suffered continually for two years, and was reduced to a skeleton; and he was far gone in hectic,

“ When I saw him he gave me this account, and then continued to complain of the extreme pain in the sole of his foot. He told me, too, that he had a strange numbness of the leg when he sat down. On examining into this circumstance, which I thought would lead to some explanation of the more prominent symptom, I found a tumour in the ham, which, when pressed, gave no particular pain, but rather a sense of prickling numbness down the leg. The tumour was, to the feeling, of a bony hardness. I conjectured that there was some tumour pressing and wedging upon the popliteal nerve, and that this injury to the nerve in its course was referable by the patient's feelings to the extremity and final distribution of the nerve. I thought of an operation, yet I was deterred from it by the dying state of the poor man, who now suffered but indirectly from the disease of the leg, and, in all probability, death was no longer to be avoided by the removal of the original cause. I thought that he might be brought round, so as to gain some strength, but within the week he died.

“ *Dissection.*—On dissecting the limb, I found a tumour under the fascia, and about three inches higher than the usual place of the popliteal aneurism. I found some nerves running over it of a remarkably pure whiteness. On tracing the sacro-sciatic nerve I found it enter into the substance of the tumour ; but, on more careful observation, I observed that the peroneal or fibular nerve, though close on the tumour, was not incorporated with it ; but that the tibial nerve, as is expressed in the plate, was incorporated with the tumour. On making a section of the tumour, it had much the appearance of a large ganglion on the tibial nerve ; the fasciculi of the nerve could be traced only a little way into its substance ; and in the interstices of the fasciculated bands a vascular fatty substance could be observed, which resembled marrow.

“ I think it is impossible to mistake the nature of this case. I have no doubt that the injury received on the ham was the cause of the disease in the nerve. This, however, might be a mere coincidence. Yet I think we cannot close our eyes to the striking proof of the affection of a nerve in its course being referable to its extremity. Had the nature of this disease been understood earlier,

I have little doubt but that cutting across the portion of the popliteal nerve, which forms the tibial nerve, or the total extirpation of the tumour, would have been succeeded by the perfect relief and recovery of the patient *."

CASE XII.—This case is reported by Mr Denmark in the *Medico-Chirurgical Transactions of London*.

" Henry Croft a healthy young man, belonging to the 52d Regiment, was wounded on the night of the 6th April 1812, at the storming of Badajos. A musket-ball entered the triceps extensor cubiti, about one and a-half inch above the inner condyle of the os humeri, which, grazing the inner side of that bone, passed obliquely downwards through the brachialis internus, and out anteriorly, near the bend of the arm. The wound soon healed, and without manifesting any particular morbid symptom during the cure. On his admission into this hospital, I found him labouring under excessive pain, which the largest opiates could not assuage, with almost constant watching. The little sleep he had, if it could be called such, was disturbed by frightful dreams and starting. I always found him with the fore-arm bent, being unable to move it into any other position by the voluntary exertion of its own muscles. He could suffer me to extend the hand, but with increased pain. It always, however, on the removal of the extending power, fell into its former bent situation. The act of pronation he could also suffer me to perform, but in like manner with increase of pain. A small tumour could be felt in the site of the wound, on the anterior part of the arm, which he could not bear to be touched without evincing additional torture. He described the sensation of pain as beginning at the extremities of the thumb and all the fingers, except the little one, and extending up the arm to the part wounded. It was of a burning nature, he said, and so violent as to cause a continual perspiration from his face. He had an excoriation on the palm of the hand, from

* "A system of Operative Surgery, founded on the basis of Anatomy, by Charles Bell, vol. ii. p. 159. London, 1814."

which exuded an ichorous discharge. The cause of this he ascribed to a shell rolling over it. His agonies, he observed, were insufferable, depriving him of sleep, and the enjoyment of his food, for which he had sometimes an appetite. He declared himself incapable of enduring it longer without some relief, and earnestly requested the removal of the arm. Before proceeding to any operation, I recommended him to try the effects of the warm and vapour baths, anodyne embrocations, &c.; but from none of these he experienced any alleviation of his sufferings.

“ The symptoms were sufficiently clear, I conceived, to lead to a correct prognosis. The part wounded, the nature of the pain, and its course from the fingers, with the exception of the little one, indicated the affection to be in the radial nerve. The increased pain attendant on the act of pronation further corroborated that supposition, from the pressure of the pronator teres upon the nerve in its passage through that muscle. The man said he had profuse bleeding after receiving the wound, yet the pulsation of the radial artery I found to be as strong as in the other arm. It was difficult to suppose the radial nerve wounded, and the humeral artery to escape; such, however, proved to be the case.

“ I proposed to my patient the possibility of saving the limb, and relieving the pain, by cutting down upon the nerve, and removing a part of it, above the wound, which he willingly consented to, but observed, that he would rather have the arm amputated at once than run the risk of a second operation. In a consultation which I held with my colleagues upon this case, when we considered the chance of failure, together with the injured state of the arm, and contracted elbow-joint, we determined on the propriety of amputation. I immediately performed the operation, and with instantaneous relief to my patient. He was discharged cured in three weeks, having, in that time, rapidly recovered both his health and strength.

“ On dissecting the arm, I traced the radial nerve through the wounded parts. It seemed to be blended with, and intimately attached to them, for the space of an inch. It had been wound-

ed, and at the place of the injury was thickened to twice its natural diameter, and seemed as if contracted in its length. This contraction, I thought, partly accounted for the bent position of the arm, and the increased pain on attempting its extension; but, on further examination, I was surprised to find, on dividing the fibres of the posterior part of the wounded nerve, that there was a small portion of the ball firmly imbedded in it, which had been driven off by grazing the bone. This description of injury more fully accounts for the exquisite pain felt by the patient. The os humeri was discoloured where it was grazed by the ball, and the humeral artery was uninjured. The nerve was evidently thickened, both above and below the wound. Would the division of the nerve, and cutting a piece of it out, have been attended with success *?"

CASE XIII.—This case is reported by Pring.

“ John Lucas, 45 years of age, was admitted into the Birmingham Hospital on account of a tumour, the situation of which corresponded with the centre of the os brachii. This tumour had been of progressive growth; it was perceived about five years previous to his admission into the Hospital, when not larger than a small horse-bean, and had increased to the size of a pigeon's egg.

“ The first appearance of it had not been preceded by pain, or spasm, affecting the muscles of the arm; nor could he attribute it to a blow or other accident. From the time of its formation, an increasing numbness had been experienced in the arm and hand; and the faculties of sense and motion had suffered a very considerable impairment.

“ Upon examining the tumour externally, its size could be very clearly ascertained. Pressure occasioned great pain, which extended both above and below the disease. No suspicion of the real nature of the case arose in the minds of the surgeons. The tumour was considered a deep-seated steatoma, and the phenomena of it were referred to its proximity to the course of a nerve. With this view of the matter, the only difficulty which was anti-

* Medico-Chirurgical Transactions of London, vol. iv. p. 48.

icipated in the operation, arose from the risk of wounding the brachial artery.

“ The tumour was, after a little dissection, exposed, by an incision of about four inches in length : its connections above and below were ascertained, and it was found to be a disease which existed in the substance of the radial (or median) nerve. It was necessary to separate the adhesion, which the whole surface of the tumour had acquired, to the surrounding parts, with the knife ; and this was cautiously and safely accomplished. A bistoury was then passed under the superior connection of the tumour, with which the nerve was divided about three-fourths of an inch above the place of its enlargement, and a similar section was repeated at about the same distance below it. The portion of the nerve which was thus cut away was about three inches in length*.

“ The circumference of the tumour was the greatest in the centre ; and it gradually diminished both above and below this point, until it was as it were lost in the natural size and structure of the nerve. On cutting into it, an expansion of the substance of the nerve appeared to form an imperfect cyst (for the distinction was not every where complete), in which it was contained, and the fasciculi of the filaments of the nerve were continued over it. The substance of the tumour appeared like a composition of medullary and fatty matter ; and its firmness was increased by the intermixture of a cellular tissue.

“ The division of the nerve was of course productive of considerable pain. The wound of the integument was closed by sticking plaster and a bandage. On the second day the arm was swelled and vesicated ; the bandage was removed, and an evaporating lotion applied constantly, under which the inflammation abated. The union of the wound by the first intention did not take place ; but the secondary healing processes went on favourably.

“ The numbness and incapacity of the arm were much increased by the removal of this portion of the nerve ; no constitutional af-

* This operation was undertaken and skilfully performed by Mr Bowyer Vaux.

fection, however, ensued, and the incision healed in less than eight weeks, at which time the man left the hospital. During the last three weeks of his abode in the hospital, the condition of the arm had undergone a visible improvement; its motions were, in a great measure, restored, and the sensibility of it was likewise considerably augmented.

“ In this case, the production of such an extent of nerve could not have been accomplished in so short a time; and yet an improvement of the faculties, which we know to be dependent on the nerves, had certainly taken place. We have before examined the question of the manner in which this increase of power may be acquired, in the article on the Relations between Nerves.

“ In order to complete the history of this case, I have lately written to Birmingham; and have been favoured by Mr Vaux with the additional information, that he saw his patient six months after the removal of the portion of nerve, and that the powers of the arm were then so far restored, that the man sustained little or no inconvenience in the use of it*.”

CASE XIV.—This case is reported by Mr Grainger.

“ Mr F. Marrian, of Buck Street, in this town, whilst pruning a gooseberry tree, wounded his thumb with a thorn, on the outside of it near the nail. It inflamed, and some poultice was applied to it by direction of a surgeon who attended him. After some time the small piece of thorn was extracted, but the inflammation continued a considerable time, and at last the parts healed.

“ He, however, still felt a good deal of pain in the part, and it began to extend to the first joint, afterwards to the second, and at last darting pains extended to the wrist and up the inside of the fore-arm. Various remedies were tried in vain to arrest the progress of the disease.

“ He thus went on for nearly a whole year, the pain continuing, and the disease constantly extending. About the beginning

* A View of the Relations of the Nervous System in Health and in Disease, by Daniel Pring, &c. p. 152, 1815.

of the second year, a small tumour was perceived under the skin, a little above the inside of the wrist. In a few weeks, a second tumour was observed a little higher up, and in a short time afterwards three others large, and several small ones, made their appearance on the inside of the forearm, the highest being near the tendon of the biceps.

“ The pains were now very great, extending up the inside of the whole arm, and darting into the shoulder, and into the muscles of the breast.

“ He now consulted another gentleman, who, after trying several remedies without any effect, recommended that the thumb should be amputated. This was objected to, and again other applications were made to the parts, and amongst the rest mercurial frictions on the arm were recommended. This was persisted in for some time. Two tumours about this time appeared above the bend of the arm.

“ He had thus gone on gradually getting worse for more than two years, the pains being now very severe, darting up to the shoulder and chest, shooting in radii into the pectoral muscles, and he thought into the cavity of the thorax. All the tumours were more or less painful; all were increasing rapidly, and those above the bend of the arm were become very large, and adhered to the subjacent muscles.

“ He was in this situation when I was desired to see him. There was some little soreness about the thumb, which seemed to have been chiefly kept up by the nail having grown into it. This had been removed, and Mr Marrian carefully kept it from irritating the part by cutting it away when necessary.

“ As all the tumours were in a state of inflammation when I first saw him, my attention was directed to allay the increased action in the parts, and that being done, the mercurial ointment was directed to be resumed, as I thought, with the gentlemen who had attended him before, that it was some disease of the absorbents.

“ As this had no beneficial effect, and as the appearances and symptoms were very alarming, I determined to remove the up-

permost tumours by incision or by caustic ; as the more I pondered on the case, and thought on the original injury, and the whole train of symptoms that followed it, I became the more convinced that the disease which I had to combat had arisen from injury to a nerve ; and thus, if my opinion was correct, the plan to be followed was evident. The method of treating the painful disease, Tic Douloureux, which had been recommended by that excellent anatomist and profound physiologist, Dr Haighton, was in my recollection, and although this was a very different disease, there was some analogy between them ; and I felt assured, that, if my view of the complaint was correct, a favourable termination would be the result of a somewhat similar practice.

“ I was induced to suppose that the disease arose from an injured nerve, first, because it was evident that it could not have arisen from a wounded tendon, as the thorn did not enter the flexor or extensor tendons ; and the whole train of symptoms had no resemblance to those which arise when tendons are punctured. If the vaginal sheath of a tendon has been pierced, on inflammation coming on, the pain is excessive. The inflammation extends rapidly downwards, involving the whole thumb or finger, and extending down to the hand, if it be not stopped by cold applications, or if an incision be not made deep down through the theca, to evacuate any fluid which may be effused or formed there.

“ *Secondly*, It did not appear to be a disease of the absorbents, for these reasons. I could not find that Mr Marrian had ever observed any hard or sore cord-like vessel running up the arm, nor had he perceived any in the course of these vessels. Neither of these appearances, however slightly they might have been, could have eluded his observation ; but if it had been possible that either of these appearances could have occurred without his having noticed them, he must inevitably have known if any of the absorbent glands had ever been enlarged.

“ There had not, however, been any swelling in those glands which are in the course of the artery, nor in the axilla. The great length of time which had elapsed from the infliction of the injury, likewise proved that the absorbents could not be the seat

of the disease ; as had it been situate in that system of vessels, it must have been terminated, in some way or other, long before the period that it had occupied.

“ As these reasons seemed quite decisive against the possibility of the tendons or absorbents being the seat of the disease, I concluded that it must have arisen from injury to a ramification of one of the superficial nerves. As the tumours above and below the bend of the arm were precisely in the direction of the internal cutaneous nerve, and as they were immediately between the skin and fascia, I could not doubt that that nerve was the seat of the disease.

“ There certainly was an objection to this conclusion, as that nerve generally terminates about the wrist ; but it is known, that the extreme branches of nerves sometimes vary in their terminations, and it was possible, that, in this case, a filament of it might have extended up the thumb.

“ As this nerve arises from the great axillary plexus, its connexion with the circumflex and with the thoracic nerves, completely explained the darting lancinating pains which were felt round the shoulder and about the chest, and the anatomy of the axillary plexus tended, therefore, the more to confirm my opinion.

“ If my reasoning were correct, the mode of practice which was proper to be adopted was evident. Analogy, and precedents, and reasoning, all distinctly pointed out the propriety of cutting off all connexion with the origin of the nerves ; and whether this was to be done by the knife or by the caustic, was left to me to determine, for, from my patient being a man equally distinguished by firmness and intelligence, I had no wavering nor obstruction to fear from him. In fact, his suffering so long and so much from the deep lancinating pains about the shoulder and chest, superadded to what he felt in the whole arm, had excited such alarming apprehensions in his mind as to the probable result of the disease going on without controul, that he was perfectly passive ; and he was willing to submit to any thing that I pro-

posed to him, if there were any probability of it putting a stop to the disease.

“ Such was his bravery, that he even proposed to me to cut out all the tumours, if I thought it necessary.

“ To cut out the lower tumours, or to interfere with them, or to amputate the thumb, would have been wrong, according to my idea of the disease; it would have been contrary to, and would have been impugning, the reasoning that seemed to me conclusive. It would have, indeed, been wretched practice, if my reasoning were right, as, if that were right, it was quite evident, by cutting off all communication of the disease with the parts above, that the symptoms below would cease, and that the tumours would soon be removed by the absorbents.

“ I hesitated whether I should dissect the two upper tumours out, or rather a large double tumour, for it was not quite divided, or whether I should destroy it by caustic.

“ If I had merely divided the trunk of the nerve, which my theory would have induced me to do, independent of some experience which I had gained on the subject before, I might thus have expected immediate cessation of all the alarming symptoms in the chest and shoulder joint; but in a case somewhat similar to this, I had not succeeded by that practice. After having divided this nerve, the pain above ceased, but a new pain arose about the back of the arm, perhaps from some branches of this nerve intermixing with others of the external cutaneous nerve or perforans Casserii, or from that nerve having partaken of the disease. In that case, after having failed in my attempt to cure by merely dividing the nerve, I dissected out the part that was painful, and even then I did not succeed till I had destroyed a considerable surface by caustic.

“ For these reasons, and also as I should have had a very extensive dissection to make, I chose to rely on the caustic in the first instance, determined carefully to watch its effects, and, if I found the pains in the shoulder and chest to increase, which I feared would be the case, then to immediately divide the body of the nerve above the tumour with the knife.

“ I chose to use the lunar caustic in preference to the other caustic, as all the others are so diffusible ; the nitrated silver being quite manageable, and I could dissect with it, as it were, any part which I chose to remove. As soon as the integuments were penetrated, a thick, almost ligamentous, substance presented itself, very different from fascia. This was gradually destroyed. It spread very considerably, and was more than half an inch thick. Layer after layer was detached, till the muscles became denuded. Before this time all the pain had ceased above the part. Of course I had nothing to do with the muscle. The diseased portion was removed, and with it the disease disappeared.

“ I cannot refrain from stating how much of the success was owing to the firmness of my patient. Not content with the slow progress of the sloughing, he forwarded it by every means in his power, and sometimes by no gentle means. We have too frequently to lament that our most matured and best plans are thwarted by the weakness of those we are attempting to serve ; but I had in this case nothing to plead in excuse of failure, on that account, if I had failed ; had that been the case, it must have been fairly attributed to my want of knowledge.

“ Most fortunately I did succeed. The pains entirely ceased. The uneasiness in the tumours on the fore-arm gradually subsided, and, as I expected, they have all disappeared, absorption having almost removed every vestige of them ; and now, February 1815, fifteen months have elapsed, and Mr Marrian remains completely well, as I have examined his arm to ascertain the state of it.

“ Were such a case to occur again, I should perhaps treat it differently. I should, in the first instance, I think, divide the nerve above ; and if that did not prove sufficient, I should apply the caustic on the incised part, so as to destroy a considerable surface. The parts, however, were so extensively diseased when I first saw Mr Marrian, and morbid action had been so long continued, above two years, that I believe, under similar circumstances, I should adopt a similar mode of treatment. Perhaps dissecting the upper tumour out, and applying caustic on the ex-

posed surface, might have hastened the termination of the business ; but I am not quite sure of this *."

I have been favoured by my friend Mr George Bell with the following very interesting account of Neuroma seated in the ham ; and to his son, Mr Benjamin Bell, I am indebted for a beautiful drawing of the preparation, of which an engraving will be found in the Plate, fig. 4.

CASE XV.—“ Mr R——, a stout plethoric person, forty-eight years of age, by trade a ship-builder, has a hard and immoveable tumour, about the size of a large orange, seated in the ham of the right side. It does not pulsate, but fluctuation is felt on its inner side. States that he perceived it for the first time about fourteen years ago, since which time it has been gradually increasing : can assign no cause for its production. There is no pain in the tumour, nor in its immediate vicinity, but he endures constant and excruciating agony in the calf and leg, which is increased on pressure.

“ No external application had any effect in diminishing the size of the tumour ; it was therefore proposed to the patient, that it should be removed by the knife.

“ The operation was commenced by making an incision from about an inch above the superior to an inch below the inferior surface of the tumour, through the teguments and fat, when, the popliteal fascia being exposed and divided on a director, a rounded mass, of a glistening leaden hue, became visible. This mass was quite smooth, and had a regular surface. It could also be moved to a slight extent, showing that its previous immobility depended upon the manner in which it had been tied down by the aponeurosis of the ham. On passing the finger between it and the bone, the artery was felt pulsating, and in close contact with

* Medical and Surgical remarks, &c. By Edward Grainger. London, 1815.

it. It seemed to be connected with the neighbouring parts, at either extremity, by a thick rounded whitish cord. This, on examination, proved to be the tibial nerve, which, after entering the superior extremity of the tumour, sent off a number of small filaments, which spread, in a fan-like manner, over its surface, and again united, to form the outer layer of that portion of the nerve which issued from the inferior portion of the tumour. From the excruciating pain which the patient felt on the tumour being touched, and from the impossibility of removing it without cutting away a large portion of the tibial nerve, it was deemed expedient, by the several medical men present, to amputate the limb.

“Dissection of the Tumour.—The tumour appeared to be contained within the theca of the nerve, and seemed to consist entirely of nervous matter. On cutting into it, however, there were two kinds of substance perceptible, a light and a dark coloured one. There was also, in a cavity, an ounce of a caseous matter, mixed with serum. The lining membrane of the cavity was of a glistening appearance, and was puckered into rugæ, resembling those of the bladder.

“The patient recovered well, and is, I believe, now alive.”

The following case is copied from the Register of the Museum of the Royal College of Surgeons of London. The patient was under the care of Sir William Blizard.

CASE XVI.—“J. J. æt. 73. March 14. 1821. Tumour under the arm, on the inner side of the triceps. Tumour had been coming on twelve months; and he suffered considerably from darting pain in the wrist. Had tried blisters and poultices, which only increased his pain. In removing the tumour it was found under the ulnar nerve, the fibrillæ of which were separated into three distinct fasciculi, one passing over its central surface, the other two on its lateral parts, and again uniting at the inferior part of the tumour. The tumour was an indurated substance, about the

size of a nutmeg. The night previous to the operation, the patient had but little rest, and in the morning a carbuncle was observed forming on the back part of the wrist, very painful. Immediately after removal of the tumour, he complained of numbness of the ring and little finger.

“ The third day after, the carbuncle became very painful; its apex presenting a circumscribed livid spot; considerable œdematous swelling of whole arm took place.

“ Tenth day after the operation, the carbuncle suppurated, and presented a favourable appearance. Erysipelas appeared, but finally disappeared under the use of wine.

“ Third week, great hopes were entertained of his recovery:— the discharge from the wound was very copious, and exceedingly offensive.

“ Abscesses formed in the arm, which were opened. Enlargement of the glands of the neck and coldness of the extremities occurred; and the patient died on the 32d day after the operation.”

The next case is taken from a Thesis published at Strasburg in 1822, entitled “ Observations sur des Tumeurs développées dans les Nerfs, par Jacques-Leon Aronssohn.” I regret very much not having been successful in procuring a sight of this work. I have been favoured, however, with the following history of the case by my friend Dr Thomson, who has a very beautiful drawing of the diseased parts, in his splendid and valuable collection of pathological drawings.

CASE XVII.—“ Dorathée Wahl, unmarried, aged sixty-nine years, entered 2d June 1818, into the surgical ward of the Civil Hospital of Strasburg, complaining of an acute pain in the palm of the left hand. This woman was of a very robust constitution; the functions were not sensibly troubled, although almost continual pains frequently deprived her of sleep; her countenance bore the mark of pain. She could give no account of her former diseases.

“ In examining the hand, I could not discover any thing differ-

ent from the natural state ; but in the middle of the internal surface of the fore-arm, I perceived an immoveable tumour, very hard, indolent, of the size and form of a pigeon's egg : it formed a small projection by its elevating the skin, which was loose and healthy : it supervened many years before without manifest cause, and had increased very slowly. Notwithstanding the use of the most energetic resolvents, employed topically during four months, the tumour continued to increase, and the ardent pain in the palm of the hand became more intense, and was frequently accompanied with fever. The patient paid little attention to the tumour of the fore-arm ; the fixed pain alone disturbed her : however, the part which was the seat of it presented no alteration, except that sometimes it was covered with abundant perspiration, without the rest of the body participating in it. The fingers of this hand were continually in a state of demiflexion ; the appetite had diminished, and sleep was disturbed. Such was the situation of this woman when she was admitted (2d October) as pensionnaire, and had left the surgical wards. Three weeks after, she came again to implore the succour of the art for the burning pain, which, having become continual, produced the most excruciating sufferings, which she compared to burning coal placed in her hand. Considering this obstinate disease as proceeding from the pressure of the tumour on the median nerve, I undertook to extirpate it.

“ I made an incision of the length of three inches and a half in the direction of the greatest diameter of the tumour. The integuments and a muscular layer being also divided, I arrived at the tumour, which had a very firm consistence. It extended so much in depth, and was fixed so firmly by the muscles and the other parts which surrounded it in every part, that it would be necessary to dissect long and painfully, in order to terminate the operation as I had at first conceived it.

“ From thence I afterwards attempted to dissolve this tumour by suppuration. I made an incision four lines deep and two and a half inches long, and, after having interposed *charpée* between the edges of the wound, I inclosed the member in a circular bandage. The operation was exceedingly painful, especially in making the

incision through the thickness of the tumour. When exposed, it showed such a degree of sensibility, that, on touching it very lightly, the patient uttered loud cries. The substance of the tumour itself was very thick, internally it had a steatomatous aspect: the effusion of blood was very considerable, without my being able to discover an artery to tie. The operation was not followed by any accident, but the old complaints continued; and, notwithstanding all the means used to produce suppuration of the tumour, the wound, which had been made, contracted, and that of the integuments proceeded towards cicatrization. The patient, already weakened, died the 6th November (the twelfth day of the operation) of an intermittent fever, quotidian, of which the access took place at night. This fever did not yield to proper remedies applied, became continued, and was accompanied with dyspnœa. The pains of the hand had always the same intensity; the diseased member became œdematous, then the others: prostration of the strength became extreme, and death took place.

“ *Anatomical examination.*—After having laid bare the tumour, I saw that it adhered to the median nerve: it was only after having cut this nerve, above and below, that it could be removed. This tumour, of a firm consistence, of an oblong form, three inches in length, occupied the middle part between the bend of the arm and the wrist; it was largest in the middle, and measured here one inch and a half. From this the tumour was of the same size, and smooth even to its superior extremity; but it became fusiform, and unequal in its inferior half.

“ The place by which the nerve appeared to enter into the tumour, was not upon the same line as that by which it went out, for this last was nearer the anterior surface, and the other approached more to the posterior surface. Above the tumour the nerve was in its natural state, whilst below it was larger, and presented, in the extent of eighteen or twenty lines, an inflammatory redness.

“ In the presence of M. le Professeur Lobstein, an incision was made into the middle and anterior part of the tumour, which

shewed, *1st*, That its three superior fifths formed a circumscribed oval mass, of a firm consistence, approaching to that of scirrhus, of a yellowish-white colour, and presenting traces of fibrous structure in many places. *2d*, That the two inferior fifths consisted of a very dense tissue, resembling the adipose cellular tissue degenerated,—a pathological production intimately connected with the former. *3d*, The fibres of the median nerve, where it reached the superior part of the tumour, were greatly separated, some of which expanded upon the surface of the tumour, some stretched even to its inferior third, others were lost in the cellular tissue, before having gained the middle part. *4th*, The nervous filaments, which, by their union, form the median nerve, had all been burst by the distension to which the tumour had subjected them, and the continuity of the nerve was due only to the presence of the tumour itself, which served as the means of union between the superior and inferior portion of the nerve. *5th*, At the base of the tumour, the nerve presents a small tubercle, which appears to be the place where the rupture of the fibres took place. *6th*, From this place the nerve enters the tumour, by means of an oval prolongation, which M. Lobstein regards as a new formation. This prolongation was twenty lines in length; it was of a very firm consistence, and presented traces of inflammation; the inferior portion of the tumour furnished to it a kind of sheath; it did not penetrate the sarcomatous portion, but passed behind, unravelling itself gradually, and losing itself in the condensed cellular tissue.

“ The piece having been submitted to a slight maceration, shewed that the nerve was really burst at the base of the tumour; but that many of the filaments were continuous with other, thin, resisting, and very white filaments, which were contained in the oval prolongation which has been mentioned *.”

Dr Descot in his extremely interesting work upon the local

* Observations sur des Tumeurs développées dans les Nerfs, par Jacque-Leon Aronssohn. Strasburg, 1822.

affections of nerves, in which he treats very fully of Neuroma, says :

CASE XVIII.—“ M. le Professeur Richerand a déposé dans les collections de la Faculté un nerf sciatique préparé par M. H. Cloquet, qui présente un développement extraordinaire dans toute sa longueur, et des séries de renflemens ou de ganglions fusiformes. Malheureusement, M. Richerand n'a pu se procurer aucun renseignement sur le sujet dont cette pièce a été extraite, et dont tout le système nerveux présentait des tumeurs analogues.” He adds,

CASE XIX.—“ M. Beauchêne a présente à la Société de l'Ecole de Médecine un kyste formé dans l'épaisseur du nerf cubital, sur un homme d'environ quarante ans.”

Descot quotes also the following account of an essay of Marandel's, from the Bulletins de l'Ecole et de la Société de Médecine de Paris.

“ M. Marandel a décrit avec soin plusieurs tumeurs des nerfs, et il a réuni dans un mémoire plusieurs observations analogues aux siennes.”

This essay I regret very much my not having been able to find. I have reason to suspect that it was not printed.

CASE XX.—The next case I have been kindly allowed to copy from a proof sheet of a general work upon anatomy, preparing for publication by my friend Dr Craigie, in which, when treating of the nervous tissue, he gives a very accurate account of tumours of the nerves.

“ Some years ago I saw, in the arm of a woman, about thirty, years of age, an oblong pyriform hard body, extending along the inner margin of the *triceps flexor*, in the site of the brachial vessels and nerves, to the anterior tuberosity of the *humerus*. It was attended with prickling pain, and alternating with numbness of the arm, fore-arm, and fingers. From these symptoms, the absence of pulsation, and its situation, no doubt could be entertained that it impli-

cated the brachial nerve. The woman refused, however, to submit to have it removed, and I have not since heard of her. The evidence of dissection as to its precise nature is therefore still wanting."

Since writing the greater part of this communication, I have been favoured by Mr Syme, Fellow of the Royal College of Surgeons, with an opportunity of seeing the disease in a patient under his care, from whom he removed the tumour with complete success. He has obligingly drawn up for me the following accurate account of the history of the disease, and of the appearance of the tumour.

CASE XXI.—James Muir, aged 43.—*30th June 1828.*—On the inner side of the left knee, about a hand-breadth above the joint, there is a narrow depressed cicatrix, two inches long. Between this cicatrix and the sartorius, there is a small tumour, about the size of an almond, and of very firm consistence. When the limb is extended, this tumour can hardly be perceived, being then overlapped by the sartorius; but when the knee is bent, it can be felt very distinctly. It is most moveable in a lateral direction; but seems pretty firmly connected to the subjacent parts, by condensed cellular substance.

The patient states that the tumour is always painful when pressed, but is more so at one time than another. The pain is not confined to the part, but shoots all over the knee, and sometimes extends from the groin to the toes. He observes that the pain is most severe during cold and damp weather. It frequently, for days together, prevents him from walking, or even resting on the limb. His story is, that, when a boy, about eleven years old, he strained his knee, by jumping into a saw-pit, which led to the formation of a large abscess that opened on both sides of the knee, viz. at the part where the cicatrix above mentioned still remains, and exactly opposite, where also there is a similar cicatrix. Several small bits of bone were discharged; and, at the end of two years, he got quite well. For the following twenty-seven years, he led an active life; ten of them were spent in a militia regiment. About eight years ago, he strained his knee while walking in his garden;

and thereafter became subject to flying pains about the joint. These pains induced him to rub the knee frequently; and, in doing so, about two years ago, he noticed the tumour. It was then the size of a pea, and has gradually enlarged. The disagreeable symptoms also, have become greatly aggravated; and as he refers them all to the tumour, he is desirous of having it removed.

“ 12th July.—Mr Wood, who was kind enough to examine the patient, having agreed with me that the tumour was seated on or in the nervus saphenus, and that it ought to be removed, I performed the little operation, with his assistance, on the 1st of July.

“ The tumour being divided shewed a firm fibrous capsule, containing a soft brownish-white pulpy matter. The nerve was traced into the tumour, but not through it. The patient made a good recovery, and remains free from his complaint.”

In the following case, the disease occurred in the internal parts of the body, where it has not yet been frequently met with. The dissection affords a very satisfactory explanation of the singularly severe and anomalous pains of which the unfortunate patient complained.

CASE XXII.—“ Clotilde Frison, âgée de quarante-neuf ans, avait toujours joui d'une bonne santé, lorsqu'elle commença à ressentir, dans le commencement de 1820, des douleurs vives dans *le corps* (expression dont elle se servait). Elles semblaient naître dans la partie gauche de la poitrine, et la malade les rapportait à une petite tumeur squirreuse, développée dans l'épaisseur de la mamelle de ce côté, et qui n'était nullement douloureuse à la pression. Ces douleurs profondes et générales augmentaient chaque jour; ne pouvant les calmer, elle chercha à s'étourdir en s'enivrant assez fréquemment. Ce moyen ne produisit pas l'effet qu'elle en attendait; les souffrances devenaient de plus en plus intolérables, et cependant la tumeur de la mamelle n'acquerrait pas plus de volume et ne devenait pas plus sensible. Elle entretenait sans

cesse les personnes qui la connaissaient du mal qui la tourmentait nuit et jour. Elle avait maigri considérablement : dans cette situation pénible la vie lui devint à charge, plusieurs fois elle tenta de se détruire, et l'on avait déjoué chaque fois ses projets, lorsque le 5 Novembre 1822 elle se précipita par la fenêtre de sa chambre, qui se trouvait à un quatrième étage.

“ Dans le haut de la cavité de la poitrine du côté gauche au-dessus de la crosse de l'aorte, il existait une tumeur pyriforme, de la grosseur d'un œuf de poule environ, recouverte par la plèvre, à laquelle elle adhérait d'un côté par une légère couche de tissu cellulaire, et de l'autre, à la partie latérale gauche du corps de la vertèbre indiquée. La base de la tumeur répondait à la courbure aortique ; son sommet tenait à un cordon blanchâtre, résistant, ayant la grosseur d'un tuyau de plume, et qui sortait du trou de conjugaison situé entre la première et la deuxième vertèbre dorsales.

“ En examinant la moelle épinière, on vit manifestement les filets des racines antérieure et postérieure de la première paire, qui se dirigeaient comme de coutume vers le trou de conjugaison, pour former la première paire dorsale ; celle-ci, après être sortie de ce trou, fournissait, comme à l'ordinaire, une branche postérieure. La branche antérieure, après avoir communiqué avec le grand-sympathique, et donné naissance à un rameau ascendant qui passait au devant du col de la première côte pour s'unir au septième nerf cervical ; cette branche, dis-je, augmentait subitement de volume, et après un pouce de trajet depuis le point de départ du rameau ascendant qu'on vient d'indiquer, elle venait se terminer, en se courbant un peu en avant, au sommet de la tumeur désignée ; cette branche, de la grosseur d'un tuyau de plume, n'avait pas changé de couleur ; son névrilème était épais, il se continuait, et se réfléchissait sur la tumeur, et se confondait avec son enveloppe.

“ La tumeur était d'une couleur blanchâtre, un peu rosée à l'extérieur : elle était élastique, de sorte que, comprimée entre les doigts, elle reprenait ensuite sa première forme ; son sommet était dirigé en haut et en dedans, sa base en bas et en dehors. Sa

face antérieure était un peu arrondie ; sa face postérieure, légèrement déprimée, présentait en arrière trois plaques cartilagineuses, de quatre à cinq lignes de diamètre. Plus haut, on voyait un certain nombre de granulations de même nature que les plaques, et qui adhéraient de même à la membrane d'enveloppe. On coupa le nerf qui servait de pédicule à la tumeur, suivant sa longueur, et l'on reconnut évidemment que son névrilème épaissi se continuait immédiatement avec la membrane extérieure de la tumeur ; il n'y avait aucune trace d'adhérence entre ces deux parties. Il semblait que le névrilème lui-même se fût dilaté pour recouvrir la tumeur.

“ Les fibrilles nerveuses, d'abord longitudinales et isolées, formaient ensuite trois faisceaux distincts, dont un plus gros se dirigeait obliquement en arrière, et s'épanouissait bientôt dans le tissu même de la tumeur, avec lequel il se confondait de telle sorte qu'il n'était plus possible de l'en distinguer. Les deux autres se portaient en avant, à droit et à gauche, et offraient absolument la même disposition.

“ La tumeur, incisée longitudinalement, offrit une surface pulpeuse, d'un blanc nacré, douce au toucher, paraissant formée de fibres concentriques, assez analogues pour leur disposition aux fibres ligamenteuses de la symphise du pubis : la couleur blanche était uniforme et nullement nuancée. La coupe n'était pas nette comme celle que présente la substance cérébrale, mais cependant elle n'était pas inégale ; on ne distinguait aucune vaisseau dans son intérieur, qui était plein partout et homogène : elle se ramollit un peu à l'air, et la surface de la section perdit de son poli ; extérieurement, elle adhérait fortement à la membrane d'enveloppe.

“ D'après la description qu'on vient de lire, il est évident que la nature de la tumeur était la même que celle du squirre non ramolli. Il existe un grand nombre d'observations de tumeurs semblables développées dans la continuité des nerfs des membres ; mais aucun auteur n'a cité d'altération de cette espèce, occupant ainsi la terminaison d'un nerf. Ordinairement, le tissu squirreux de ces tumeurs est parsemé de vésicules ou de petits kystes, renfermant le

liquide d'apparence sirupeuse qui appartient au squirre ramolli. Ici, ce tissu n'offrait qu'un même aspect, et l'on ne pouvait y découvrir les nerfs qui le pénétraient, ce qui prouvait que leur altération était de la même nature que celle de la tumeur. Enfin, on ne peut meconnaître, je crois, la cause de ces douleurs sourdes et profondes que la malade disait ressentir *dans le corps* : elles étaient évidemment produites par la malade locale dont il est ici question. Cette dernière circonstance n'est pas moins digne de remarque, que les autres détails présentés dans cette observation *."

The next case is taken from the Register of the Pathological Collection belonging to the University of Wurtzburg, in which the preparation is preserved.

CASE XXIII.—“ A man, æt. 39, was affected with subcutaneous steatomatous swellings over his whole body ;—a disease which he appeared to have inherited from his father. He had otherwise been in good health till two or three months before his death, when he complained of feeling rheumatic pains over the whole body ; and soon afterwards violent pains in the head, which came in nocturnal fits, with vomiting, grinding of teeth, and double sight. These increased in frequency and violence, and the limbs became affected with numbness, and he died.

The whole left side of the brain was displaced by an enormous swelling of the left *crus cerebelli ad pontem Varolii*. The brain was otherwise healthy ; there was some serum in the third ventricle. A tumour of the size of a pea was found behind the left fifth nerve, and similar tumours on different parts of the spinal cord, connected with it by cellular texture.]

All the nerves of the body were three or four times thicker than natural, and covered with gangliform swellings. The nerves of the upper and lower extremities, the plexus brachialis, and sacralis, as they proceed from the vertebral foramina, were changed

* De la Moelle Epinière et de ses Maladies, par C. P. Ollivier, d'Angers. A Paris 1824.

into thick nodose strings; one of the ischiatic nerves was $1\frac{1}{2}$ inch in diameter.

The preparation shews, on the one side, the brachial plexus, and on the other the *sympathetic* nerve, both diseased.

CASE XXIV.—William Miller, ætat. 39, labourer, was admitted into the Royal Infirmary of Edinburgh on April 1. 1814, and was under the care of my friend Mr George Bell. The history of the case is taken from the register of that institution. “In the triangular space, formed by the sterno-mastoid and trapezius muscles, and the clavicle, of the right side, there is a hard lobulated, prominent tumour, which dips beneath the margin of the former muscle; the trachea is pushed to the opposite side. There is a frequent lancinating pain, hoarseness, and a troublesome cough in the morning, attended with expectoration. Speech, deglutition, and respiration, are greatly affected and impeded. Pulse 96, and equal in both arms. Frequent rigours. The right side of the face, and the corresponding arm, are at times œdematous, and the head is turned down upon the right shoulder. This affection began some time ago, and is becoming gradually larger.” Leeches were repeatedly applied, and different remedies, both general and local, were had recourse to without relief. The patient died suddenly of suffocation fourteen days after his admission into the hospital. The œdema of the right arm increased prodigiously, and all the other symptoms were much aggravated before death.

I have been favoured, by my friend Professor Turner, with the following very accurate and interesting description of the diseased parts, which were carefully prepared by him, and are preserved in the Museum of the Royal College of Surgeons.

“The tumour on the right side of the neck is six inches long and three broad; it extends from the base of the cranium to the lower part of the neck, and lies along the course of the large vessels, under the sterno-mastoid and omo-hyoid muscles. When cut through, it is found to consist of a firm, uniform substance, of a light-brown colour, and opaque. The texture is of a fibrous appearance, and is somewhat flexible, and tough, excepting at one

part, towards its lower and outer margin, where a portion, of the size of a walnut, consists of a white pulpy substance, easily broken down. At the upper part, the *nervus vagus* passes upon the surface of the tumour, and extends down its anterior and outer part in its whole course. This nerve is much increased in size, being as large as the popliteal nerve, and it is of a denser structure than natural. It adheres to the tumour, and for a considerable space is flattened upon it, and incorporated apparently with its outer surface; so that the two cannot be separated from each other, without the texture either of the tumour or of the nerve being injured. The superior laryngeal branch is seen given off from the *nervus vagus*, and running across the upper portion of the tumour, to the surface of which it is firmly attached, to be distributed upon the larynx. The lingual nerve is seen crossing the tumour, but unconnected with it, apparently of a larger size than natural. The trunks of the common and of the internal carotid artery, run along the anterior surface of the tumour, at about an inch and a half from the *nervus vagus*. The artery adheres to the surface of the tumour, by firm cellular connexion, but can be separated from it, without the texture of either being injured. The inner margin of the tumour lies in contact with the larynx and trachea, pushing them somewhat towards the left side of the neck; and from about the middle of the tumour, a rounded projection arises, which presses the muscles and lining membrane of the pharynx inwards, so as to fill up, in a great measure, this cavity, and to compress the upper part of the larynx and the orifice of the glottis. The outer edge of the tumour is in contact with, and attached by cellular substance to, the plexus of the cervical nerves.

“ On the left side of the neck, there is, opposite to the larynx, a similar tumour, of a much smaller size, and oval form; it is three inches in its longest, and nearly two inches in its shortest diameter. The *nervus vagus*, though considerably larger than natural, is not nearly so large as that on the right side. On passing along the tumour, it divides into three or four fasciculi, which adhere to the surface of the tumour, and some of them are firmly incorporated with its substance. The structure of this tumour

resembles that of the opposite side, but it is solid throughout. The thyroid gland and the lymphatic glands of the neck are in a healthy state."

From particular circumstances, I have been prevented from placing this case, as I have done almost all the others, in its proper situation, according to chronological order.

I have now detailed all the cases of well marked Neuroma which I have been successful in collecting. Cases recorded by Petit *, and by Gooch †, have been referred to, by some of the writers upon the subject, as being of this nature ; but, upon an attentive examination of them, they do not appear to me to be sufficiently well marked, in regard to their connexion with the nerves, to warrant their being considered as nervous tumours.

* Memoires de l'Academie Royal de Chirurgie.

† The Chirurgical Works of Benjamin Gooch.

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* Mémoires de l'Académie Royale de Chirurgie.
† The Chirurgichal Works of Benjamin Gooch.

Fig. 3.



AN NEUROMA

EXSECTION OF THE PLATE

Fig. 1. The ... of the tubercle removed from the ...
... case is detailed in p. 16 of the ...
... Tubercle ...
... as it exists in the foot ...
... the ... is detailed in p. 19 of the ...

Fig 4

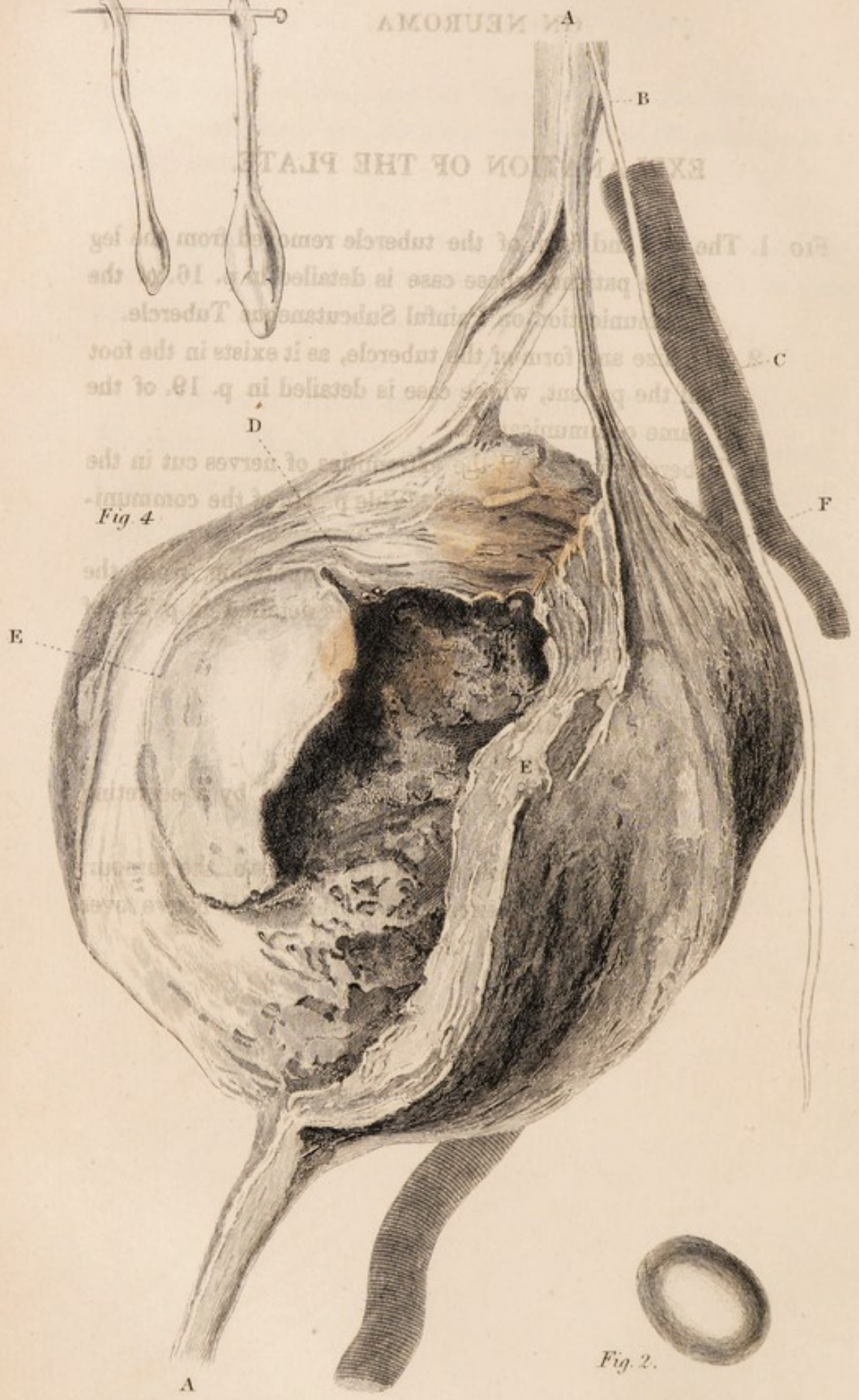


Fig. 2.



Fig.



EXPLANATION OF THE PLATE.

FIG. 1. The size and form of the tubercle removed from the leg of the patient, whose case is detailed in p. 16. of the communication on Painful Subcutaneous Tubercle.

2. The size and form of the tubercle, as it exists in the foot of the patient, whose case is detailed in p. 19. of the same communication.

3. Tubercles formed at the extremities of nerves cut in the operation of amputation. Vide p. 15. of the communication on Neuroma.

4. The nervous tumour taken, after amputation, from the ham of the patient whose case is detailed in p. 52. of the same communication.

A A, The Tibial Nerve.

B, The Fibular Nerve.

C, The Popliteal Artery.

D, The Cavity of the Tumour lined by a secreting membrane.

E E, The enormously thickened parietes of the tumour.

F, The fan-like expansion of the Tibial Nerve over the surface of the tumour.

