tine has been found so valuable—a fact of great interest in reference to the previous portion of this paper.

Eight or nine years ago a patient was admitted into the General Hospital of this town, labouring under aggravated syphilitic lepra. He was treated with mercury, until its full constitutional effect was produced. The eruption disappeared, but an intense iritis almost immediately supervened. He was now placed upon turpentine, which realized all that its most ardent advocates have declared. The exudation was absorbed, and the integrity of the eye maintained. The patient subsequently became afflicted with one of the most severe phlegmons below the deep fascia of the neck which I have ever seen. But he finally escaped with his life, and with health apparently fully restored.

Now it is in such cases as this that I should push the steel tincture with the utmost freedom. I anticipate the greatest advantage from its use. The exudation may be got rid of, I believe, and the mercurial anemia combated at the same time.

I have recently observed the disappearance of the fibrinous film from vesicated surfaces in a case of diphtheria, and the complete arrest of its production under the use of this remedy, in the course of forty-eight hours after its first administration.

It is probable that there are cases of diphtheritic iritis having no connexion with any other infection, just as Von Gräfe has so ably proved there are cases of diphtheritic ophthalmia of an epidemic character, as lately observed by that distinguished ophthalmologist in Germany. Reasoning from my experience of the more common forms of the infection, I should imagine that the treatment above indicated would be found here of great value.

In conclusion, I beg my readers to enter upon a course of observation of the points alluded to, without prepossession, other than that which is inseparable from the human mind in its pursuit of truth, and to favour their brethren with a conscientious record of the results obtained.

ART. IX.—*Removal of the Superior Maxilla for Disease of that Bone, at the Kilkenny County Infirmary.* By Z. JOHNSON, A. M., F. R. C. S., &c. &c., one of the Surgeons to that Institution.

THE publication of those surgical operations which are more formidable and more rare, with a faithful account of the result, and the experiences of the operator, seems to have been

always considered as a sort of debt due at once to the surgical profession and to the interests of humanity. The history of any individual case, however surprising or interesting, can be useful only when, contrasted with others of an identical or analogous nature, it helps to clear up some difficult or doubtful point, or sets at rest some question previously in abeyance. In both medicine and surgery many important questions can be decided only by a comparison of results; and the more extended this comparison, the safer the conclusions arrived at. This is true in all branches of the healing art, but nowhere is the accumulation of evidence more important than in the history of the capital operations of surgery. The propriety of undertaking any one of these must depend on the probabilities of success, and this can only be decided by reference to the results of all the similar cases ascertainable. The more formidable or uncommon the operation, the greater the necessity for all such evidence, and wherever the archives of the profession are inadequately supplied, the duty of adding to them would seem to become imperative in proportion to the importance of the case and the infrequency of its occurrence.

These remarks are offered as some apology for encroaching on the pages of the *Dublin Quarterly Journal* with the description of a case of disease of the antrum, and the details of the operation performed for its removal.

To any one possessed of a very superficial knowledge of the general anatomical relations of the superior maxillary bone, and of the parts interested in its removal, it must be sufficiently obvious that the excision or resection of the upper jaw in its entirety must be, under any circumstances, a very formidable undertaking; but when to the difficulties which encompass the removal of the sound bone we add the complications of disease, the derangements of structure arising from morbid changes, the displacement of parts, and the liability to various embarrassing contingencies which are always possible, but cannot always be foreseen, we only place under review the real circumstances which attend on the removal of a diseased antrum.

The operation is an important one, too, and not less so than it is formidable. The diseases of the upper jaw are numerous, and its removal is often the only means of saving or prolonging life. These diseases are, some of them, of malignant character, some of them benign in their nature. Either the bone itself or the cavity of the antrum may be the seat of the disease. Cancer, polypus, hydatid, caries, nævus, fibrous and bony growths, have all been met with in these parts, while occasionally collections of pus or occluded secretion have so

distended the antrum as to produce, in time, great deformity and inconvenience. In the case of malignant affections it is plain there can be no chance of life but by the entire removal of all infected parts; but even in the case of many of the non-malignant affections, removal of the whole upper jaw becomes necessary, because experience has shown that, if not effectually removed, they will go on steadily increasing until they come not only to produce hideous deformity and the loss of some of our most useful senses, but eventually interfere with functions essential to the support of life itself. It is not, then, merely as a triumph of skill or as a successful instance of surgical daring, that this operation is to be regarded, but it becomes truly important as one of the many methods which surgery has contributed towards lessening human suffering and prolonging life, when all other means of cure or remedy have become utterly hopeless.

There is another consideration which adds additional interest to this operation. The circumstances which call for its performance are comparatively uncommon, and very many an experienced surgeon has, no doubt, passed through a long life and extensive practice without once meeting a case requiring it. The records of the profession, it is true, cannot be said to be altogether deficient in data on this subject, many cases of its performance having been published by eminent surgeons at home and abroad; still, the entire amount of evidence available would scarcely appear sufficient for the purposes of the statistician, or the magnitude of the interests at stake, and under this impression another is now added to the cases already on record, and the experiences of the operator transcribed for the benefit of those who may have occasion hereafter to address themselves to this very momentous undertaking.

It is not intended here to enter into an elaborate history of, or even essay on, this particular operation. The subject has been already ably treated of; and those who wish to know who first projected so bold an undertaking, who had the honour of first realizing its execution, when it was first conceived, and by what train of reasoning its feasibility was established, will find all these and many other interesting particulars very fully given in an excellent article in the thirty-first Number of the present series of this Journal, by Mr. Butcher of Dublin, who has collated much valuable information on the subject, and given it to the profession, along with the details of his own very interesting and successful "Case of Excision of the Upper Jaw." I shall only briefly remark that the credit of first proposing the entire removal of the upper jaw for disease, Mr.

Butcher would seem to have established for Lizars of Edinburgh, so far back as 1826, although it would appear, according to the same authority, that Gensoul anticipated him in the actual performance of it in 1827, Lizars himself not having realized his own proposition until 1829. It matters little, however, to science who first proposed an operation, or who performed it, if only a useful addition has been made to our knowledge or our resources. If the question of priority should at any time arise, all must acquiesce in the justice of giving to each his due—"palram qui meruit, ferat;" beyond this it is of little consequence. But in any researches on this head it will be necessary, to discriminate between two classes of operation really very different; or, as Mr. Butcher remarks when endeavouring to decide to whom the origination of the maxillary resection was due, "operations on the upper jaw may, in reality, be classed under two heads." They are—

1. The scooping process and removal of parts of the bone.
2. Removal or disarticulation of the entire bone.

The first of these, or removal of parts of the bone, appears to have been performed at a very early period, so far back as 1693, and since then by Desault, Garengéot, Dupuytren, and other surgeons. It was the proved inadequacy of this proceeding, particularly when malignant disease was present, that led to the inquiry whether a more complete and effectual operation could not be performed. Disease was apt to return, particularly malignant disease, where any trace of the morbid structure remained behind. The well-known tendency of malignant disease to involve adjacent parts rendered a complete extirpation here, as elsewhere, imperatively necessary; otherwise it was sure to reappear, and the patient, after having fruitlessly undergone all the suffering and danger of a painful operation, died miserably at last. This led bold and master minds to devise a more perfect remedy than had been previously attempted or thought of, and accordingly, much about the same time, the idea of removing the entire bone would seem to have been conceived by more than one, though Lizars may be entitled to the merit of being the first who formally proposed it, pointing out, at the same time, the way in which it might be done, and the several steps necessary, as he thought, for its accomplishment. Of these, one was the tying of the carotid artery, which was actually performed in some of the earlier cases of this operation, but which, as experience has shown, is not at all a necessary preliminary under ordinary circumstances.

It is this proposal of Lizars, the removal of the entire bone,

which concerns the reader at present. It has been frequently performed since^a, and with an amount of success greater than, perhaps, the most sanguine could have anticipated. Indeed, when we consider the nature of the parts involved, their anatomical relations, the severity of the operation, and the dangers, immediate and secondary, which attend upon it, one can scarcely but wonder not only at the share of success it has enjoyed, but even more at the rapidity with which the patients have recovered from it: in some instances the patient is said to have been up and moving about on the eighth, and out of doors on the thirteenth or sixteenth day. In most operations of a minor character such speedy recoveries are infrequent.

But the proposal of Lizars, since realized by so many eminent surgeons, would seem to have been surpassed by the Drs. Heyfelder, the elder of whom, when Professor of Surgery at Erlangen, removed both upper jaws in three different cases, first in 1844, and subsequently in 1850 and 1852. A very interesting essay on the Resection of both Upper Jaw Bones, communicated by the younger Dr. Heyfelder, will be found in the forty-fourth Number of the present series of this Journal, in which he gives the history of the cases operated on by his father, together with notices of the operation as performed by several other surgeons; from which it would appear that Diefenbach, Maissoneuve, Langenbeck, Dietz, and Jüngken have, as well as his father, essayed this formidable undertaking with various success; and that out of nine cases so operated on, four had died; of these, one is said to have survived a few days, one to have died of apoplexy, and two from relapse of cancer, for the removal of which the operation had been performed, but after a lapse of fifteen months and twenty-three months respectively from the resection. Such were the statistics of this operation up to the year 1857. The amount of success indicated is almost more than could have been hoped for; and it is stated that the deformity resulting from the removal of both upper jaws is not so great as that which follows from the removal of one. Any one who wishes for further information on this subject will be well repaid by a reference to the very interesting essays of Dr. O. Heyfelder and Dr. Butcher, already alluded to, and to be found in the thirty-first and forty-fifth Numbers of this Journal.

The object of this communication being only to record one

^aThe surgeons who have performed this operation, up to the present day, are, Lizars, Dupuytren, Gensoul, Liston, White, Syme, Robert, Mott, Velpeau, Lisfranc, Dieffenbach, O'Shaughnessy, Fergusson, Heyfelder, Cusack, Butcher.

other successful case of removal of the superior maxillary bone, and to describe the nature of the operation performed, the disease which called for it, and the ultimate result, it becomes necessary to proceed with the more pertinent details at once.

The patient, Patrick Mullrone, an agricultural labourer, applied first at the Kilkenny County Infirmary, in the year 1852. He was then fourteen years of age, and of a particularly sound and healthy aspect, and easy, contented expression of countenance. He presented three tumours of the head and face: one, a small, vascular, and cherry-like tumour, growing from the conjunctiva of the upper lid and external half of the left eye; another, a soft, flabby tumour, to the outer side of the left temple; and the third, an enlargement, at this time but incipient, and not at all remarkable, of the left cheek.

The two latter tumours at this time gave him no concern. He resorted to the hospital for the purpose of having the tumour of the eyeball removed. But as it was exquisitely sensitive, and any interference with it proved extremely painful, he absconded before anything effectual could be done for its removal, not, however, until the tumour on the temple had been cut down on, and found to consist only of a mass of redundant areolar tissue, which was removed; and also one of the molar teeth was at this time drawn, and a trocar passed into the antrum, but without bringing away any fluid, or, indeed, throwing any light on the cause of the enlargement of the upper jaw.

He was not seen afterwards for several years. In the spring of 1857, five years after his leaving the hospital, he reapplied for admission. It would have been impossible now to recognise him, his features were so distorted by a large tumour occupying the left side of the face, raising the left eye-brow above the level of the right, depressing the palate of the same side on the tongue, while it protruded forward so as to remind the spectator of a snout, as seen among the lower animals, at the same time displacing the nose toward the right side, and obstructing both nostrils, the left completely, the right very considerably, by its pressure on the septum narium. When examined through the mouth, it was found to extend backwards toward the tonsil, while the right half of the palate was encroached on and narrowed by the lower part of the tumour, which extended considerably beyond the mesial line: indeed, the tendency of the growth was decidedly inwards or towards the right side, much more than to the outer or left side, where it would not have met with such solid resistance.

It was quite evident that all this deformity was produced by an inordinate expansion of the antrum maxillare; that it was not of a malignant nature was more than probable, as the general aspect of the patient indicated rude health; besides the growth had been very slow; the tumour was well defined, and its progress had been wholly unattended with pain.

It was in consequence of the great inconvenience he suffered that he applied at the hospital to beg that something might be done to relieve him. Independent of the deformity produced, deglutition was beginning to be interfered with, and he could not sleep but with his mouth open.

It was now (many months before the operation) that the photograph was taken, from which figure No. 1 is copied, and as it failed altogether to convey a just impression of the antero-posterior projection of the tumour, an attempt was made to take a plaster cast of the head and face, which could not but give an exact idea of the deformity. The patient, however, happening to open his mouth while the plaster was soft and semi-fluid, experienced so much annoyance from the flow of it into his mouth and among the crevices of his teeth, that he again absconded from the hospital on the following day.

He was obliged, however, to return again in the following November (1857). The tumour had continued to increase, and the inconveniences arising from it became more and more intolerable every day. It was now determined on to proceed to operation without delay, that he might not have the opportunity of absconding again.

A full consultation was held, and it was agreed by all that the disease was not of a malignant character, and that all the circumstances rendered the removal of the superior maxillary bone not only justifiable, but necessary. Accordingly, on the 2nd November, 1857, the operation was performed in the following manner:—

The patient being seated in an arm-chair, and an exploratory trial having been first made, to ascertain with certainty, before proceeding to the disarticulation of the bone, that the contents of the antrum could not be fluid (a fact which was determined by the removal of a portion of the anterior wall), an incision was now made, commencing below the inner canthus of the eye, and carried down the side of the nose, round the junction of the nasal cartilage and cheek, and vertically down the lip. An elliptical incision was next made, parallel to the fibres of the orbicularis palpebrarum, and extending from the commencement of the first incision outwards towards the zygomatic suture. The cheek was then dissected off the front of

the tumour, drawn backwards and outwards, and held so by an assistant. The eye and its appendages were separated from the floor of the orbit, and kept upwards by means of a bent spatula, held by an assistant standing behind the patient. The zygomatic arch was divided by a strong, curved, bone forceps. This required the exercise of considerable strength, but would have been easily effected had the arms of the forceps been longer. The junction of the maxillary with the nasal and lachrymal bones was readily severed with the same instrument, one blade having been first insinuated into the compressed nostril. An incisor tooth had been extracted at the commencement of the proceedings, but in consequence of the encroachment of the tumour beyond the mesial line, it was found necessary to extract the incisor of the right or distal side. The membranous portion of the hard palate was now dissected from the bone by a thin spatula, placed upon the flat, as far back as the velum palati. The alveolar ridge was divided by a small saw in the site of the empty incisor socket, and the separation of the palate plates of the maxillary bones effected by the strong bone scissors, one blade having been applied along the floor of the left nostril, and the other inserted into the cut made by the saw in the alveolar process. The superior maxillary nerve, as it enters the infra-orbital canal, was divided by a scalpel-blade passed flatwise along the floor of the orbit. This was rendered in some degree difficult by the shape of the tumour, which rose in front very much above the level of the orbital floor, as may be seen by a reference to the drawing of the tumour given in the accompanying plate, or an inspection of the tumour itself^a, whereon the attached portion of the floor of the orbit will be seen on a line nearly with the zygomatic process. The same cause created some difficulty in the necessary division of the orbital floor, but it was accomplished by a very strong scalpel blade.

All the bony attachments of the upper jaw-bone had been now divided, and it remained only to dislodge the tumour from its position. With this intention pressure was made on it from above, in the expectation that it would have started from its place, but to no purpose, as it was found to be perfectly immovable. It was next firmly grasped, the thumbs of both hands embracing the upper and anterior conical protuberance of the tumour, and the fingers being introduced into the mouth, so as to take firm hold on the palate and alveolar ridge, and

^a The tumour may be seen at the Pathological Museum of the Royal College of Surgeons, where it has been deposited.

although it was forcibly swayed upwards and downwards, and from side to side, alternately, it was some time before the tumour yielded in the least degree. At last, by the exertion of repeated efforts and great force, it gave way, but was found, on examination, to have broken across, and to have left behind a considerable portion of the hinder part of the growth, very solidly and immovably impacted in the parts behind and around it.

The removal of this latter portion was by much the most difficult and most anxious part of the operation. It presented a smooth face, or wall, in the seat of the fracture, extending back deeply among vital parts, and in close proximity with great vessels, and was extremely firm and immovable, while it afforded no irregularity by means of which lever or forceps could have gained any advantage. By nicking it, however, in suitable places, with Hay's small saw, both forceps and lever were respectively enabled to take their hold, and it was dislodged in several pieces, but not without some trouble. One piece, in particular, was so firmly incorporated with the front of the pterygoid process of the sphenoid bone as to bring away a portion of it along with itself, which may be still seen attached to the hinder part of the tumour.

The patient, who had endured the several steps of the operation with great fortitude, now fainted, and had to be laid for some time on a mattress, which was ready at hand.

The cut surfaces were allowed to remain exposed to the air until the patient began to recover from the syncope. The amount of hemorrhage on dislodging the hinder and more deep-seated portions of the tumour was extremely inconsiderable, and it was fully expected that, as he recovered from the faint, more or less smart bleeding would ensue. After waiting for some time, however, none appearing, the great chasm which had been formed by the removal of the tumour was carefully packed with pledgets of soft lint, to each of which ligatures had been attached in such a way as to provide for their subsequent removal through the mouth. The flap formed of the cheek was replaced in its natural position, the opposing surfaces of the divided lip were brought into exact apposition by the hare-lip suture, and the remainder of the great cheek-wound accurately secured by numerous points of the interrupted suture.

It had been anticipated that, in the first instance at least, there would have been a tendency in the cheek to collapse or fall in, as a natural consequence of the great loss of substance, and the vacuum thereby caused in the seat of the tumour. All such apprehensions were unnecessary, as it was found that

the tendency of the replaced cheek was altogether to preserve even still more than its natural convexity; a result which followed from the great redundancy of material which had been produced by the stretching of the cheek over the tumour, aided by the elasticity of the parts, which served to preserve much of their original conformation.

The membranous part of the hard palate had been divided just behind the alveolar ridge, and it was inclined at first to flap up and down somewhat awkwardly, so much so that it was proposed to pass a ligature through its free edge, and fix it by bringing it out between the lips of the transverse incision, and then keep it secured on the cheek as long as might be necessary. The idea, however, was abandoned, and the expedient found afterwards to be unnecessary, as the membrane shortly became rigid from the effect of inflammation, and assuming the horizontal position of its own accord, continued to retain it, and did not cause any further inconvenience. The *velum palati* and *uvula* were undisturbed, and preserved their natural position.

The patient was greatly prostrated by the immediate effect of the operation. After having been left for some time in perfect quietness upon the mattress on which he had fainted, he was carried on it to his ward and laid on his bed, without allowing him to change his position, or make the smallest exertion. He had been very liberally fed in the morning, and for several preceding days, in order to prepare him as well for the severe trial he had to undergo as for the abstinence which must necessarily follow it, in consequence of the condition of the mouth and fauces sure to be left by the several steps of the operation. He did not seem to stand, therefore, in need of any immediate nourishment. An assistant was left in charge, with orders to allow no strangers near him, and to observe the most perfect quietude.

He was visited again at 6 o'clock P.M., and appeared to have been going on, during the interval which had elapsed, very satisfactorily. He was free from pain, conscious, and able to make himself understood, but still completely prostrated by the shock of the operation. There had been but little reaction; but, what was most satisfactory, there had been no hemorrhage, nor was there any appearance of any tendency to it. As there did not seem to be any occasion for interference of any kind, he was left undisturbed, with orders, as before, to observe quiet, and avoid everything which could excite or disturb him.

10 o'clock P.M. He was visited again. He was free from

pain and there was no appearance of hemorrhage. There had not been much reaction, but he seemed uneasy and restless. An anodyne enema was ordered, with one drachm and a half of tincture of opium, with the view of getting him a good night's rest and tranquillizing the system.

November 3. The morning after the operation. Had passed a tolerably good night; got some sleep; was free from pain; able to swallow some milk; no appearance of hemorrhage; on the whole, going on favourably.

Afternoon of same day. Pulse had risen to 120, and there was a good deal of restlessness and uneasiness; he was now ordered an enema with one drachm of tincture of opium. It is scarcely necessary to observe that the state of his mouth precluded the administration of medicine in any other form.

4th. Had a favourable night; system much tranquillized; doing well; has taken milk and also broth, without much inconvenience; not much incommoded by the discharge from the mouth and nostrils, although he lies, as yet, altogether on his back; two of the needles confining the upper lip were now removed; the lower one was still left undisturbed; he was ordered a repetition of the opiate enema at night, as it was considered most desirable to secure him rest, and to keep up a tranquillized condition of the system, if possible.

5th. Doing well. Had a good night; several sutures were now cut and removed, as a great part of the wound had healed by the first intention; appears more himself, and to be shaking off the great prostration which followed the operation, and had scarcely abated until now. The bowels had not been moved at all since then, and, with the intention of at once stimulating them and conveying nutriment to the system, he was ordered an ample enema of strong broth and olive oil. This acted satisfactorily, while a considerable portion was retained. He got his anodyne enema at night, as it was not thought judicious to withdraw its sedative influence too suddenly.

6th. Doing well; had an easy, tranquil night and a good deal of sleep; is much pleased at finding he can sleep with his mouth shut, as the passage of the nares, which had been occluded for many years, is now permeable by air; pulse down to 84. The last of the hare-lip needles was now removed, and some of the other sutures also taken away.

7th. Rested well. Suppuration from the mouth more profuse. Some of the lint pledgets, which were becoming loose, were now removed. No hemorrhage. He is able to take a fair proportion of milk and strong broth. As his bowels had not been moved since the 5th, he was ordered to have a repeti-

tion of the enema of strong broth and olive oil, to be given with the long tube, as before.

10th. Has been progressing very favourably. Sleeps without any anodyne; is not much incommoded by the discharge from the mouth; is able to get down a fair quantity of nourishment, and takes egg and crumb of bread mixed with his milk and broth. Some more of the lint pledgets have been removed. Pulse down to 76. He was now allowed to sit up in bed.

14th. Doing well. In good spirits, and able to express himself more intelligibly. All the sutures, and most of the lint pledgets, have been removed. He was now allowed to have, in addition to his other diet, some meat finely chopped.

16th. Progressing favourably in every way. The last lint pledget was about this time removed; although a very large cavity remained, there was no collapse whatever of the cheek. Most of the external wound, with the exception of one small piece on the side of the nose, had long since united by the first intention. He expressed a wish for more to eat, and the full diet of the hospital, with extra bread and milk, was at once ordered for him.

From this out, until his discharge from hospital, he went on without any change or symptom deserving of notice. The suppuration from the parts within the mouth, which had never caused him any extraordinary inconvenience, was now moderate, and gradually becoming less. The small spot on the side of the nose, which suppurated, and was the only part of the external incision which refused to unite by the first intention, healed rapidly, and left scarcely any mark even at this early period. The nose, which had been pushed so much to one side, was rapidly regaining its proper position, along with its symmetry. Of the primary incisions there was little trace; the chasm corresponding to the seat of the tumour was still large, but rapidly filling up by granulation. The membranous remains of the hard palate retained the proper position, and was daily stretching over to meet the cheek, in such a way as promised to leave but little deficiency of palate at last. His articulation was gradually improving also, while he could swallow either solids or fluids without any difficulty or regurgitation. But what seemed to gratify him most of all was the ability to sleep with his mouth closed, a luxury which he himself said he had not been able to enjoy for many years before the operation.

This patient returned home early in December by his own desire, in perfect health and wonderfully improved in appear-

ance. At this early period there was very little trace of the extensive incisions, which were unavoidable in order to remove so large a tumour. The left side of the face was still more convex than natural, but as interstitial absorption proceeded, it was daily approaching more nearly to its natural proportions and position, and promised soon to betray but little vestiges of deformity or operation.

The tumour, which is irregular in its form, measured, in its longest diameter, $3\frac{3}{4}$ inches; transverse diameter, $2\frac{5}{8}$ inches; height, from level of palate to apex of the most anterior and highest part, $3\frac{1}{4}$ inches^a. Such are the actual measurements. When divided in its longest axis it proved a perfectly solid mass, varying in consistency, the anterior portion, which constituted the greater part of it, and which might be regarded as the body, presenting to the naked eye the appearance of a cartilaginous nucleus surrounded by a bony case. The posterior part, which is very irregular in shape, and which had to be removed in detached pieces after the tumour had been broken by the efforts made for its removal, does not amount in bulk altogether to more than about one-third of the anterior or body. The mass is evidently not homogeneous, and this part, which in some degree looks like a process, or congeries of irregular processes from the back of the tumour, is much harder than any other part of it, and harder than bone, turning the point of a very hard drill, and conveying the idea of a gritty material. There is no evidence traceable to determine from what particular point the growth originated, though it was very palpable that it had a decided tendency or inclination toward the mesial line, and the regions beyond it, notwithstanding the greater resistance it must have met with in this direction. It is not easy to reconcile the difference of appearance, form, and composition, between the anterior and posterior divisions of the tumour, with the supposition of a simple deposit or growth gradually expanding the antrum, or to believe them to have been the product of the same process or morbid action. In the anterior mass traces would seem to exist of a bony shell distended by a horny or cartilaginous nucleus, becoming less consistent toward the centre; but this peculiarity of construction, which anteriorly is so well calculated to suggest an abnormal deposit gradually distending the antrum maxillare to an unnatural and inconvenient size, becomes indistinct as we proceed backwards until all traces of a primary wall or case is lost, while the composition of the mass sensibly changes, but

^a See Plate.

without any line of division or demarcation, the one running confusedly into and being amalgamated, as it were, with the other. It was at first conjectured that the back wall of the antrum had been absorbed in consequence of the pressure exercised by the growth or deposit within its cavity, and that on its removal the deposit had, as it were, broken loose, adapting itself to the varying resistance of the contiguous parts, and thus accounting for the irregular and nodulated appearance of the hinder part of the tumour. This supposition, however, would entirely fail in accounting for the marked difference of composition between what would seem to have been the true original tumour and the growth, so different from it, yet so firmly attached and identified with its posterior boundary. The only explanation of this which would appear at all consistent or satisfactory is perhaps that given in the description of the microscopical character of the disease which follows:—

The tumour having been presented to the Pathological Museum of the Royal College of Surgeons, Dr. John Barker, the Curator of the Museum, examined the different parts of it under a microscope of high power. A copy of the details of the examination, as they were obligingly furnished by him, is annexed, viz.:—

“The anterior portion, forming the bulk of the tumour, is enveloped in a casing of true bone. It is very friable and granular, and exhibits a bony cellular structure, like that presented by a collection of hollow oil globules compressed together, but rather more irregular and oval in form, about 1–300th of an inch in the long diameter. The walls of these cells are made up of closely packed cellules 1–2000th of an inch in diameter, and more angularly irregular, and flat; no true bone cells to be found; and no distinct indications presented by polarized light.

“The posterior portion of the tumour is of a very dense nature, hard, and structureless, even when examined by a power of 600; without bone cells or arachnoid lines. When examined by a power of 400 with the polariscope, it shows a structure somewhat similar to that of horn or ivory, and gives me the idea of having been developed, under great pressure, in a conchoidal manner. On the whole, I think the anterior portion was not malignant; and the posterior part I look upon as a protecting effort of nature, to prevent the ingress of the tumour on the brain.”

Whether Dr. Barker's ingenious suggestion be correct or not, it is certain that a very remarkable difference is apparent between the structure and composition of the anterior and pos-

terior portions of the tumour, while it is impossible to assign any line of demarcation between them, so thoroughly do they seem to be identified at the seat of juncture. It would seem probable, too, that this posterior part was not secreted, or deposited from behind, as, on dislodging each of the nodulated processes which terminated it on that side, it came out with a smooth and glazed surface, leaving a cup or bed of corresponding appearance^a, and giving the idea of a ball-and-socket joint. Its identification with the back of the tumour would suggest its origination in that quarter, while the marked difference of its composition and nature would contra-indicate it. It only remains, then, that it must have been deposited from the vessels of the surrounding parts; and if we accept the suggestion of Dr. Barker, which seems to acquire probability from examination and consideration of the subject, we must consider it as a very beautiful instance of the prophylactic powers of nature, exerting themselves to make timely provision for a danger while it was yet at a considerable distance.

Before concluding the account of this operation it may be allowable to state, for the assistance of those who may hereafter be called on to undertake it, the experiences of the operator, so far as this one case was concerned, and his reasons for selecting the mode of proceeding which was adopted.—First, with respect to tying the carotid artery as a preliminary step, although some of the early operators considered it necessary, the experience of many cases has now shown that it may be safely dispensed with, and that it can scarcely be required in any case in which the operation would be justifiable. The actual evulsion of the superior maxilla is not attended with the hemorrhage which might be naturally anticipated from a knowledge of its anatomical relations; but this is the only hemorrhage that need cause any solicitude, as that arising from the division of the superficial parts is under easy and immediate control, and presents no difficulty to the surgeon. In the case which has been recited, the hemorrhage occurring at this stage was, comparatively speaking, almost nothing—but this was probably to be accounted for by the slow growth of the tumour, its dense consistence, and the pressure it exercised on the surrounding parts, which probably may have had the effect not only of compressing, but even obliterating, many of the vessels with which we know that region is so profusely supplied, and which must otherwise have given more or less of trouble. It is not meant, then, to establish any rule on the

^a The nodule which brought away part of the sphenoid bone was an exception.

circumstances of a single case, which might itself be exceptional, but merely to corroborate the testimony of practical surgeons as to the inexpediency of a measure in itself attended with no inconsiderable severity and risk. Pressure, styptics, exposure to the air, and, when indispensable, the actual cautery, have been found sufficient to command the worst hemorrhage which has as yet occurred in these cases; and when we consider that both upper jaws have now been removed in many instances, without tying a carotid, and without fatal or uncontrollable hemorrhage in any one of them, it does not appear that the tying of that vessel can be necessary as a preliminary measure in any ordinary case.

With respect to the best mode of commencing the operation or the denudation of the bone, as several different methods have been proposed and severally adopted by different operators, it may not be amiss to say a few words here on their respective merits. An indispensable consideration in every case must be the securing of sufficient room, not only for the removal of the tumour, but for getting conveniently at its osseous connexions, so as to separate them readily and effectively, and in every case the operator must be guided in the selection of his plan by the circumstances of the case. The inclination of the growth may and does vary; in some, as in the case just recorded, being inward towards the parts beyond the mesial line and upwards; in others, outwards or downwards, and sometimes, at the same time, in both these latter directions. Accordingly, we find different operators making the primary divisions of the cheek in various ways on different occasions. It would not, perhaps, be possible to predicate absolutely that any one of these is the best; but we may conclude fairly that each chose on each particular occasion the plan of operation best suited to the case he had to deal with. As some of the methods which have been used seem under ordinary circumstances to present advantages over some of the others, the several modes of denudation which have been resorted to may be cursorily noticed here, according to the classification adopted by Dr. Heyfelder in his essay already alluded to.

Having remarked that the operation consists essentially of two acts, first, the denudation of the bone, and secondly, the division of its osseous connexions, he divides the first into three principal methods, subject to modifications, and these he enumerates as—

1. The median incision, from the roots of the nose through the middle of the upper lip.

2. The posterior lateral incision, from angle of mouth to outer angle of eye.

3. The anterior lateral incision, from inner corner of eye round wing of nose and through upper lip.

These have been sometimes variously combined, where it was necessary, from the nature of the distortion, to obtain great room. Occasionally, where only one of them was used, transverse incisions were combined with them, sometimes toward the angle of the eye, sometimes toward or over the zygoma, and sometimes transversely and parallel to the fibres of the orbicularis palpebrarum, the intention being in each case to obtain the utmost possible room with the least possible mutilation.

The mode of denudation which was chosen in the case which forms the subject of this communication, and which, with some modification, corresponds with that distinguished by Dr. Heyfelder as the "anterior lateral incision," was selected from an impression that it not only was the most suitable to the case in hand, but that it presented several advantages over the median and posterior lateral incisions. First, it promised ample room for the removal of the diseased mass, which proved to be the case; then the cicatrices resulting from it, falling to a great extent into the line of natural folds and hollows, are likely to be to that extent concealed, as in the case of the transverse elliptical incision, which corresponds with the natural rugæ of the lower palpebra, and is not at all conspicuous; and that round the ala of the nose, which is completely hidden from view. The remainder of the incision, on the side of the nose and through the upper lip, healing for the most part by the first intention, can scarcely be said to leave a cicatrix, and the little that is visible after the operation in a few years or months becomes almost obliterated. By this mode of section, too, the division and injury of very important parts is avoided; the facial vessels and ramifications of the portio dura nerve, save their extreme terminal branches, escape division. Hence hemorrhage is avoided as well as delay, since no vessel will require to be tied, while at the same time the deformities likely to arise from division of the portio dura nerve will be avoided. The facial muscles also escape division, and the natural expression of the countenance and correspondence of the opposite sides of the face are preserved. These are important considerations, and seem all in favour of this mode of effecting the denudation of the bone, where circumstances allow of the posterior lateral incision being dispensed with.

The division of the zygomatic arch can be accomplished by

a strong forceps. The arms should be long, and the application of a good deal of strength may be requisite, but it is preferable to using the saw, which must be much more distressing than the steady action of the forceps, which accomplishes the object without tearing or shaking the patient. The mallet and chisel, which have been used by some, particularly in the earlier cases of the operation, ought surely to be discarded. They are unworthy of modern surgery, must increase the amount of violence necessary, while it is scarcely possible to conceive circumstances in which they could not be replaced by more scientific and equally effective instruments. In separating the membranous part of the hard palate from the bone an advantage will be found in incising it immediately behind the alveolar ridge, and not, as has been recommended, farther back, near the junction of the maxillary and palate bone. It will no doubt flap up and down at first, an inconvenience which might be obviated by passing a ligature through it and securing it in such a way, before laying down the cheek, as to entirely prevent this inconvenience. But this will scarcely be necessary, since in a very short time inflammation renders it turgid,—it becomes stiff, resumes the horizontal position, and gives no further trouble.

In the case which has been detailed chloroform was not given, for the reasons which have deterred most surgeons from using it in this operation. To prevent in some wise the flow of blood backwards and through the fauces, the patient must, as long as possible, be kept erect. Accidents from chloroform have been said to be most frequent in the erect posture, and reasons have been given for always placing the person to be subjected to it in the horizontal position, as being safer and less liable to casualty; but beyond this, were the blood to flow backward (as more or less certainly will), while the patient were in a state of insensibility, it might flow into the larynx and windpipe, and, the sensibility of these parts being for the time suspended, suffocation might ensue. This contingency is considered by some improbable, but it is possible, and undoubtedly the interests of the patient, as well as those of surgery, require that it should be strictly avoided.

In some of the cases of this operation, already on record, the patient is represented as being up and walking about on the eighth day, and leaving hospital proportionably soon. In the case just recited the patient, though a remarkably strong and healthy young man, did not rally from the immediate effects of the operation for three days. He lay in a state of semi-stupor, listless and passive, and, as he himself afterwards

described his feelings, "stunned" by the operation. After the third day, however, he came to himself rapidly, became cheerful, soon asked for more food, and about the tenth day expressed a desire to be let out of bed. He was not allowed up, however, until the twelfth or thirteenth day, and was not permitted to return home until nearly six weeks after the operation, although he certainly might have left hospital with impunity a good while before that period. He had, however, a long way to go, and it was considered desirable to keep him within view as long as possible.

July 7, 1858. He has been seen on this day. The symmetry of the face is excellent; it requires sharp inspection to detect the cicatrices. The chasm left by the tumour is nearly filled up by granulation; the palate approaches nearly to the lip; both nares are open, and articulation is very good and intelligible; deglutition perfect, save that, if he were to take a *large* drink, he would be liable to some regurgitation through the nose. There is no appearance of any re-generation of the morbid growth. His health is excellent, and his entire aspect betokens a sound diathesis.

On the whole, the result of the operation has been most satisfactory.