

existing between them and the Council of Pharmacy at the present time. That can be extended in many ways, especially as to therapeutic matters. He welcomes this as he does everything which will tend to improve the relations between the professions of pharmacy and of medicine, between the individual physician and the individual pharmacist, and also between the profession of medicine and the manufacturer on whom in the last resort physicians are frequently compelled to depend, simply because so many pharmacists have ceased to prepare their own galenicals. Dr. Cohen prefers when it is possible, to send his prescription to a pharmacist who makes his own fluid extracts, his own infusions and so on, but a great many men do not, and, after all, he must depend on some manufacturer who has made the preparation the druggist dispenses. Therefore, he must come into relation with the manufacturers, willy nilly. Let it be a definite and understood relation. The profession should have some means satisfactory to both sides of controlling the products of all reputable manufacturers. Commercial exploitation is not always bad; neither is it always good. If properly controlled, the good can be increased, the bad minimized. In 1858, Benjamin Ward Richardson introduced hydrogen dioxide to the medical profession. He laid down fully the indications and rules for its use. It was largely neglected until about 1880, when a manufacturing chemist began its exploitation. Despite Richardson's authority and ability, the profession might never have used this valuable agent had it not been commercially exploited. That particular manufacturer, however, asserted in regard to the therapy of hydrogen dioxide, many things which Richardson, being a scientific physician, did not assert. His product moreover, was defective; it was too highly acid. Physicians led astray by the commercial literature and neglecting to refer back to Richardson's writings, began to do much harm with the drug. That is the other side—the want of control. Many other useful drugs in and out of the Pharmacopeia have owed their general introduction to the exploitation of the manufacturers; on the other hand many useless drugs are exploited by them to the general detriment. The attitude of the profession should be one of encouragement to legitimate and scientific enterprise, of discouragement to fraud or unscientific pretense. In other words the medical profession must resume a friendly control of pharmacy.

RESULTS OF IMPROVED TECHNIC IN OTOLOGIC SURGERY.*

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Of late the technic of otologic surgery has steadily improved. Some of the advances in this line have already been generally accepted, while others are only regarded tentatively, or are not fully recognized. I consider only those improvements that are not accepted by all otologists and that have not yet been incorporated into their routine work. These improvements are largely connected with the physiologic treatment of wounds which materially shortens the convalescence and notably improves the results.

1. The advantages of a thorough mastoid operation are great. In this operation not only all the diseased tissue in sight is removed, but also the whole mastoid process ablated, and the zygomatic, occipital and jugular cells, if present, are opened, to expose all the cellular diverticula of the middle-ear system. The advantages are that there is no possibility that the convalescence will be much delayed by any remnant of the infected material which had inadvertently escaped removal, and a secondary operation will not be required except for possible intradural complications. The slightly increased operative time can not outweigh these benefits. Cases 10 and

25 show good results of this method. Bad results of a less extended operation are seen in Cases 1, 9 and 14 (Fig. 1).

2. The time consumed by the operation has been considerably shortened by the use of the three following instruments: *a.* Electric burrs of improved pattern are most useful in work on sclerosed bone or in finishing off an operation by the removal of irregularities and opening the recesses difficult of access to other instruments. *b.* Richards' curette is an instrument which allows direct boring in the bone and can be used to advantage in all but the very hardest bone. It thus dispenses with the need of chisel or gouge in most cases. *c.* My hand-driven front-bent gouge can be used instead of a chisel or mallet-driven gouge to open the hardest bone and in the delicate carving required in the excavation of the deeper parts.

These three instruments add greatly to the facility, safety and speed of the operation. Much time can now be saved in the operation, because it is no longer neces-

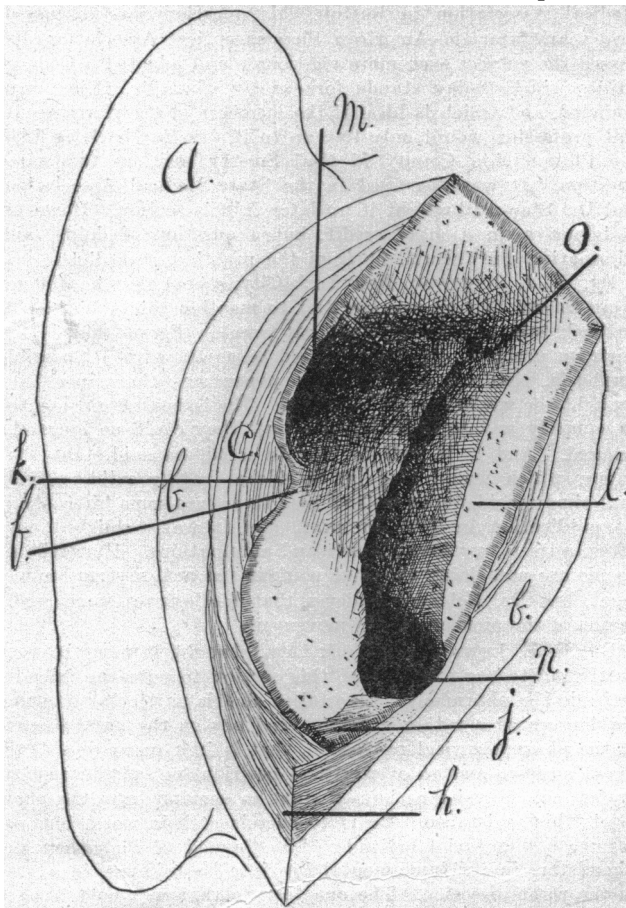


Fig. 1.—Simple mastoid operation for acute mastoiditis, the jugular cells have been thoroughly opened. The zygomatic, superior petrosal and occipital cells were not well developed. *a*, auricle; *b*, skin flap; *c*, periosteum; *f*, posterior wall of osseous meatus; *h*, sternomastoid muscle; *j*, digastric muscle; *k*, posterior wall of membranous meatus; *l*, convexity of sigmoid sinus; *m*, mastoid antrum; *n*, jugular cells; *o*, superior petrosal cells.

sary to polish the osseous walls till they shine again if the blood clot dressing is to be used. Cases 5, 6, 9, 10, 11, 14, 16 to 23 and 25 show shortened time of the operation.

3. The soft parts are moved and handled during the operation with greater care than they used to be, in order to preserve the periosteum intact and to avoid laceration and contusion of the soft parts which might delay the physiologic reparative process. The disposal of the soft parts after completion of the operation has been very much simplified. In the simple mastoid, when the blood

* Read in the Section on Laryngology and Otology of the American Medical Association, at the Fifty-seventh Annual Session, June, 1906.

clot dressing is used, the soft parts and edges of the mastoid wound are allowed to adjust themselves. The coaptation may be made secure with deep sutures or preferably by a subcutaneous continuous suture of silver wire. In the mastoideotympanic operation, the mastoid wound is treated in the same way as the simple mastoid. I first tried this method in a case operated on Sept. 24, 1904. There is no longer need of a complicated plastic operation on the meatus. The meatus may be slit or left intact. I first left it intact in a case operated on May 23, 1904. In either case the meatus is not distended or the packing of the meatus is very light. Cases 10 and 25 have the meatus intact (Fig. 2). The closure of the Eustachian tube can be best effected by pushing the mucous membrane forward from the tympanic mouth of the tube and packing it toward the isthmus of the tube (Cases 12 and 18). I treated my first case in this way Sept. 14, 1904, by using a part of the drum membrane to cover the orifice of the tube.

The soft parts are manipulated always with the pur-

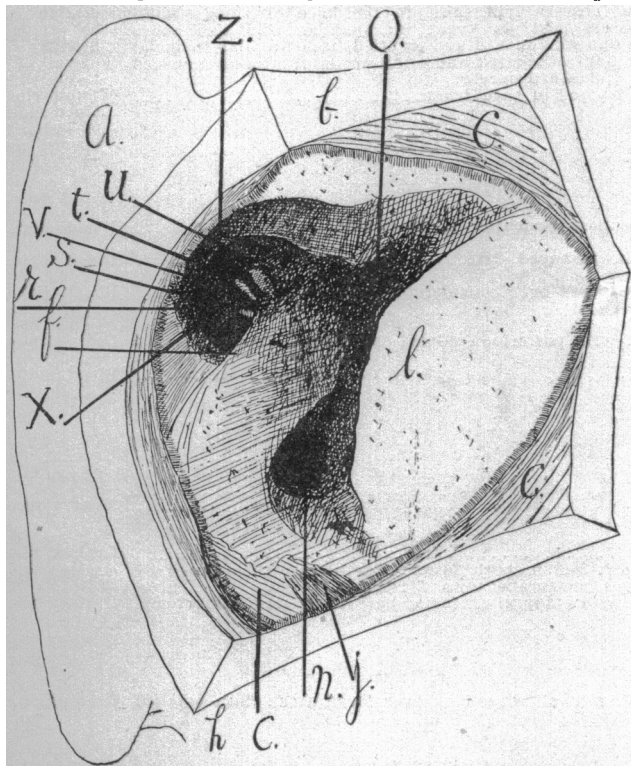


Fig. 2.—Radical mastoid operation, showing membranous meatus without the plastic flap: a, auricle; b, skin-flap; c, periotomeum; f, posterior wall of osseous meatus; h, sternomastoid muscle; j, digastric muscle; a, convexity of sigmoid sinus; n, jugular cells; o, superior petrosal cells; r, anterior wall of osseous meatus; s, stapes; t, facial nerve; u, horizontal semicircular canal; v, processus cochleariformis; x, Eustachian tube; z, tegmen.

pose in view of avoiding a secondary operation and shortening the convalescence by the quick formation of a firm cicatrix in the track of the operation. Exposure of the dura mater has been proven to have no retarding action on the convalescence. I first closed a wound with an extensive exposure of the dura mater in a case operated on June 19, 1904.

4. I have modified the procedure of the ordinary radical or mastoideotympanic operation in order to preserve the tympanum with its ossicles and membranous attachments in place, to secure a maximum of drainage through a circular incision of the membrane, together with the usual complete removal of the osseous structures, but with retention of the annulus. This is indicated in cases in which the function of the tympanum

is fairly good and when there is no caries. I first tried this method June 27, 1905 (Case 15).

5. A careful study of the currents in the venous sinuses and veins of the head and neck justifies the precautionary measure of ligating the jugular vein before opening the sinus for thrombosis. This measure is intended to prevent setting a portion of the thrombus adrift. The ligation of the jugular vein above the facial, when the jugular is not diseased below this tributary, is indicated for the preservation of all the collateral circulation possible (Cases 2 and 3). When phlebitis of the bulb of the jugular is suspected it is best to open it by excavating its outer walls after first laying the sigmoid sinus open to this point, as shown in Figure 3 (Case 3). Case 1 was a fatal case in which the jugular was not ligated.

6. Brain abscesses are treated advantageously by the open method of extrusion in which no packing is used and there is not a too large meningeal opening, but with liberal removal of the brain tissue with the intent of exposing the abscess cavity by the removal of its outer wall. If a hernia should threaten, let the abscess be in the extruded portion. Large portions of the brain may be removed without danger to life, and mutilated and disorganized brain tissue is safer outside than inside the calvarium. The physiologic method of getting rid of

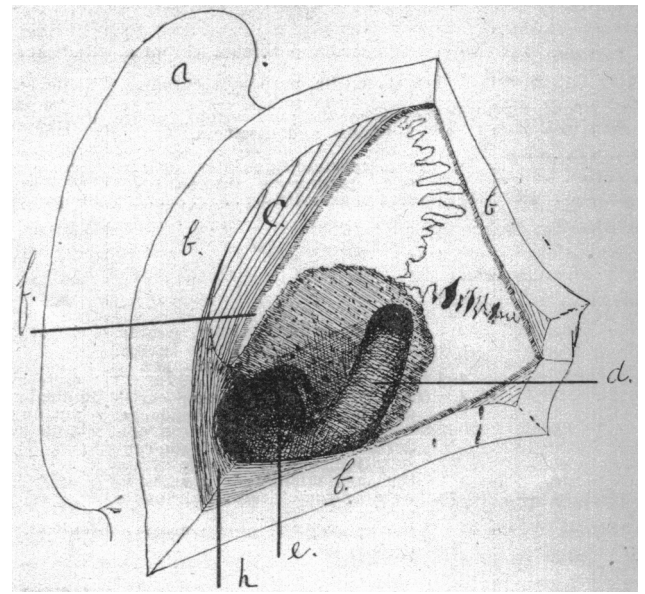


Fig. 3.—The jugular bulb and sigmoid sinus opened; operation was stopped before the mastoid antrum was entered. a, auricle; b, skin-flap; c, periotomeum; d, inner and posterior wall of sigmoid sinus; e, jugular bulb; f, posterior wall of osseous meatus; h, sternomastoid muscle.

localized infected brain tissue is by the natural process of extrusion or hernia. Case 3 was treated by this method Nov. 15, 1905.

7. Progress toward physiologic or natural wound repair has been greatly advanced by the closure of the mastoid wound and the blood clot dressing after the simple mastoid operation, as advised by Blake, for the promotion of healing by first intention (Cases 9, 11, 19 and 20). If the clot breaks down, it does not matter much (Case 9). This procedure has been modified to give a maximum of union by first intention, together with drainage from the depth of the wound. This object is accomplished by closure of the wound, except for a small cigarette drain in the lower angle. My modification of this latter method is an early removal of the drain after the first 24 hours which allows the lower corner of the

wound to collapse. This insures a more rapid healing than in those cases in which the drain is left in a week or so, and seems to lessen the breaking down of the clot, probably by increasing the flow of serum. I use this method in all cases that do not promise well by the simple blood clot (Cases 21 and 23). In case the clot becomes infected, no damage is done, and the healing process progresses more rapidly if no packing is used (Case 21). The simple blood clot is indicated only in

selected cases, while my modification of the drained blood clot is indicated in all other cases. Dr. Reik has adapted a protective sheath for covering the operative field, which ensures against infection of the wound from the skin and hair, and accounts in some measure for his excellent results with the blood clot.

8. The blood clot in the mastoideotympanic operation, as advised by Blake and Sprague, is as useful as in the simple mastoid operation. My first experience with this

AUTHOR'S RECENT OPERATIONS ON THE MASTOID REGION.

No.	Name.	Age.	Diagnosis.	Operation.	Treatment of Wound.
1	E. S.	28	Operation in consultation; mastoiditis and sinus thrombosis; later, brain abscess.	Dura mater uncovered and found to be gangrenous over large area; small cerebral abscess (softening) ant. and int. to knee of sinus. Sigmoid sinus opened throughout its length and found empty except for thin, yellow, long fibrinous clot; no bleeding from below; operation discontinued on account of failure of respiration; jugular not ligated.	Packed because gangrenous tissue had not been removed.
2	J. D.	35	Operated in consultation; simple mastoid operation 9 days before; sinus thrombosis.	Old wound opened and dura exposed over sigmoid sinus, which was diseased at the knee; jugular vein ligated above facial vein and sigmoid sinus opened throughout its length.	Packed; probability wound would be reopened.
3	L.	5	Oper. in consultation; a Wilde's incision 3 days before; otitis media purulenta chronica; jugular thrombosis; later, gangrenous necrosis, cerebral and cerebellar softening (abscess).	Dura uncovered and found gangrenous in region of sigmoid sinus; small cerebral abscess lying ant. to the knee of sinus; small cerebellar abscess post. to knee; int. jugular vein tied above facial vein; sinus was opened and emptied from torcular to facial vein; jugular bulb evacuated and outer walls of abscess removed with scissors and sharp curette.	Packed because operation could not be prolonged sufficiently for removal of necrotic tissue.
4	S. G.	12	Chronic purulent otitis media following mastoid operation.	Radical; dura exposed in both fossæ.....	Wound closed with blood clot at time of oper., but soon opened and packed by house officer
5	A. P.	7	Otitis media purulenta chronica.	Radical; dura exposed; meatus, L-shaped slit.....	Blood clot
6	A. S.	7	Otitis media purulenta chronica.	Radical; meatus, L-shaped slit.....	Blood clot
7	A. K.	38	Otitis media pur. chron., severe headache and dizziness.	Radical; dura exposed over considerable area.....	Blood clot, meatal flap, L-shaped.
8	G. T.	21	Acute mastoiditis; later, epidur. and episinuous abscess.	Simple mastoid, with posterior epidural extension.....	Drained blood clot.
9	W. M.	14	Acute mastoiditis.....	Simple mastoid.....	Blood clot
10	M.	36	Acute mastoiditis; later, epidur. abscess, osteomyelitis; extensive basilar exp. of meninges.	Radical	Meatus not slit. ..
11	H. N.	4	Acute mastoiditis.....	Simple mastoid.....	Drained blood clot.
12	M.	24	Otitis media pur. chron.; caries of tympanum, severe headache.	Radical; dura exposed in both fossæ; Eustachian tube closed by pushing mucous membrane toward isthmus.	Drained blood clot.
13	A. R.	36	Subacute mastoiditis; later epidural abscess; operation in consultation, no discharge from the ear; middle ear conditions were chronic catarrhal otitis media.	Simple mastoid with epidural extension backward; no myringotomy.	Drained blood clot.
14	J. W.	34	Acute mastoiditis, later osteomyelitis.	Radical, extending in all directions over large area; dura exposed in both fossæ.	Drained blood clot.
15	R.	17	Acute mastoiditis.....	Modified radical; dura exposed in both fossæ.....	Blood clot.....
16	A. B.	45	Acute mastoiditis and otitis media pur. chron. following mastoid operation.	Radical	Wound closed by blood clot but soon opened and packed by house officer.
17	E. M.	16	Otitis media pur. chron.; had had previous mastoid operation, old style.	Radical; dura exposed; L-incision of canal.....	Blood clot.....
18	M. C.	12	Otitis media pur. chron., with two postaural sinuses following a previous operation.	Radical; dura mater exposed in both fossæ.....	Blood clot.....
19	I. W.	4½ mos.	Acute mastoiditis.....	Simple mastoid.....	Blood clot.....
20	A. D.	4	Acute mastoiditis.....	Simple mastoid.....	Blood clot.....
21	M. M.	4 mos.	Acute mastoiditis.....	Simple mastoid.....	Drained blood clot.
22	E. R.	3	Chronic mastoiditis, and otitis media purulenta chronica.	Radical; dura exposed in middle fossæ.....	Blood clot, L. meatal flap cut.
23	A.	3	Acute mastoiditis.....	Simple mastoid.....	Drained blood clot.
24	S. L.	17	Otitis media purulenta chronica.	Radical; dura exposed in both fossæ; L-shaped cut of meatus; subcutaneous catgut suture; Eustachian tube closed by packing mucous membrane toward isthmus.	Simple blood clot. .
25	T.	56	Acute mastoiditis, very extensive involvement.	Radical; exposure on dura of both fossæ and extension of dissection nearly to jugular bulb.	Drained blood clot, no slit or plastic of meatus.

was in a case operated on Sept. 14, 1904 (Cases 6, 7, 17, 18, 22 and 24). If the clot breaks down, I do not pack. I began this method April 21, 1905, and have found the final healing and epidermatization slightly, if at all, delayed in the infected cases (Cases 5, 7, 14 and 18). My drained blood clot is similar to this procedure in the simple mastoid operation. The small cigarette drain should be removed after the first 24 hours (Cases 12 and 25). Rapid healing is the rule. No reopening

has been required in any case. If the blood clot breaks down extensively, it takes place in less than 5 days and the wound opens of itself and drains well (Case 14). In Case 10 there was delayed healing caused by packing. The bad effects of packing after the radical operation are shown in Cases 4 and 16.

9. Epidural abscesses do well with the drained blood clot dressing. The wound is closed round a cigarette drain. The first case I treated in this way was operated

AUTHOR'S RECENT OPERATIONS ON THE MASTOID REGION.

Time, min.	Wound Closure.	Middle Ear Dry.	Hearing Result.	Final Result.
60	No granulation.....	Continued to discharge till death.	Not taken.....	Death from general septic infection; no metastases.
75	Granulated	In a few days.....	Normal	Total recovery, cosmetic result, condition excellent.
90	Neck and postaural wound healed on 52d day by granulation.	146th day; membrana tympani absent.	Watch, 4 in.....	Complete recovery, slightly depressed, smooth, postaural surface, slight scar in neck at one point only.
60	Wound closing well by first intention on 2d day, after which it was opened and packed by house officer; shows no signs of closing, 308 days after.	Shows no signs of getting dry, does not discharge externally.	Watch, 7 in.....	A very large posterior opening leading into middle ear, no tendency for epidermis to enter the middle ear or encroach on sides of large postaural opening, which continually secretes mucopus that dries on edges and does not run out.
40	Slow closure; wound infected later.....	35th day.....	Not taken.....	Imperceptible scar; perfect contour.
40	First intention, 4 days.....	44th day.....	Watch, 9 in.....	Imperceptible scar, even contour.
60	On 5th day wound was closed, by first intention; became infected and wound was opened on 8th day; 10th day nearly closed again.	21st day.....	"Much better since operation."	Scarcely perceptible linear scar, no change in external contour; headaches have ceased.
60	Wound healed, first intention, except at exit of cigarette drain.	15th day; membrana tympani completely healed.	Good	Linear scar, even contour.
28	On 2d day wound and canal suppurating; on 4th day secondary operation. 35 min.; behind former wound knee of sinus uncovered, several suppurating pneumatic cells found int. and post. to digastric fossa; wound not packed but allowed to close with blood clot; 4 days later wound suppurating; finally closed 16th day after 2d operation.	32d day.....	Watch, 26 inches..	Slight keloid in the upper part of linear scar; no unevenness of contour.
45	Packing removed from wound on 4th day; entirely healed on 22d day.	Practically dry, 18th day.....	Watch, 1 inch.....	Small scar, nearly smooth postaural surface.
6	Wound closed on 4th day, first intention....	Nearly dry, 4th day.....	Not taken	No scar or unevenness.
90	On 4th day, removed drain from wound, which closed on 6th day.	8th day.....	Better than before op., watch 10½ in.	Linear scar, no change of contour.
55	Wound closed on 7th day, except very small sinus at seat of cigarette drain.	Throughout convalescence.....	Unchanged; poor..	Linear scar, smooth contour.
55	Wound closed at first by first intention, except at exit of cigarette drain; later, about ¼ of wound broke down, wholly closed 20th day.	Nearly, 23d day.....	Watch, 3 inches...	Extensive even depression above and behind auricle; complete unilateral facial paralysis, gradually recovering.
45	Wound almost entirely closed by first intention, 5th day.	Removed packing from meatus, 2d day; middle ear dry, 5th day.	Normal	Linear scar, small keloid at one point; no unevenness of contour; mastoid process regenerated.
55	Posterior wound healed in 33 days.....	Granulations in tympanum. 33d day; dry, 158th day.	Watch, 1 inch.....	Large postaural depression.
47	Third day, first intention.....	3d day, packing removed from meatus; 13th day, practically dry.	Unchanged; poor..	Linear scar, small pit at the seat of former operation; no other deformity.
50	Wound closed on 3d day, first intention, except at central point, which was breaking down; 10th day wound closed finally.	Practically dry, 10th day.....	Unchanged; poor..	Linear scar; even surface.
6	Wound closed on 6th day, first intention....	8th day.....	Not taken	Very faint linear scar; even surface.
4	Immediate by first intention; first day postaural wound could hardly be discovered.	Less than 105 days.....	Watch, 18 inches..	No scar; even surface.
12	Wound infected; drainage discontinued on 3d day; did not close by first intention, but was healed on 9th day.	9th day.....	Not taken	Linear scar; even surface.
36	No suppuration, closed on 21st day.....	Removed packing from meatus. 2d day; dry, 13th day.	Not taken	Recurrent serous and seropurulent discharges from postaural wound and pus in canal; scarcely perceptible scar.
15	Cigarette drain removed 2d day, wound healed except at exit of drain.	7th day.....	Not taken	Imperceptible scar.
60	On 3d day wound closed by first intention...	14th day.....	Watch, 2½ inches.	Barely perceptible linear scar; contour undisturbed.
45	Closed on 2d day, except at lower angle, where cigarette drain came through; drain removed; 4th day lower angle of the wound was also healed by first intention.	6th day.....	Not taken	Barely perceptible scar; even surface.

on June 19, 1904 (Cases 8 and 13). The blood clot broke down in Case 14. Case 10 was one of epidural abscess with convalescence delayed by packing a few days.

10. The improved cosmetic result is very marked after the blood clot dressing, because the scar is only linear, and when the bone wound has been leveled off and enough of the posterior wall of the osseous external meatus removed to make a fairly even surface no deformity can result (Cases 3, 5, 8, 12 and 19 to 25). Deformity resulting from packing the wound is shown in Cases 4 and 16.

11. Among the advantageous results following the improved technic is a lessening of the operative risk, due to diminution of shock because of the shorter time consumed in the operation and the avoidance of jar to the nervous system. The jar is avoided by discarding the mallet and using instead the new instruments described in Paragraph 2. Absence of shock is shown by Case 24.

12. The shortened convalescence is due partly to the

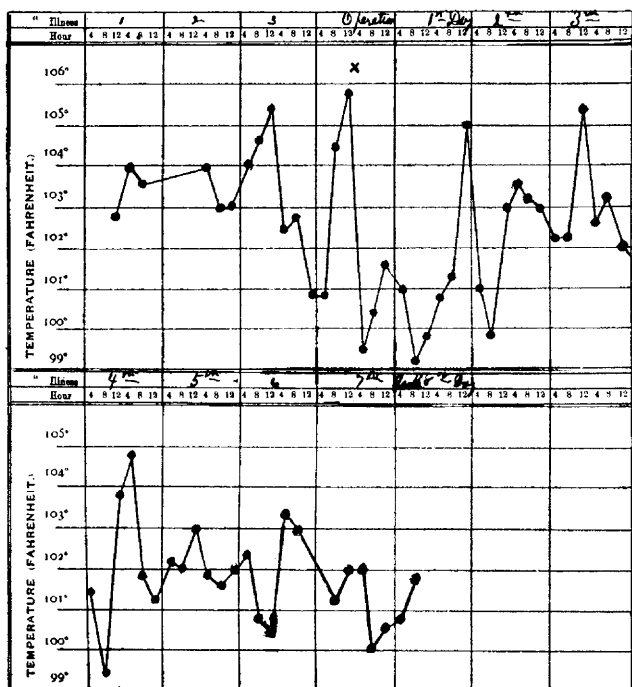


Chart 1.—Case 1.

better physical condition of the patient at the time of operation, because the operation is now usually undertaken before the patient's resistance is severely handicapped by the advance of the disease. It is also due to the improved manipulation of the soft parts and to their careful preservation and protection from unnecessary laceration and contusion during the operation. It is also due to the more scientific postoperative treatment which does not conflict with the well-known physiologic reparative process of Nature, but utilizes them to the best possible advantage in the blood clot and its modification. Nature's granulations do their intended work without stint or hindrance (Cases 6, 8, 11 to 13, 15, 17 to 22, 24 and 25). Slow convalescence, due to packing the wound, is shown in Cases 4 and 16.

13. Secondary operations are avoided by the thorough primary operation, by the encouragement of the formation of a firm cicatrix in the track of the operation and by the expeditious convalescence which prevents reformation of necrotic centers.

14. The preparation, operation and after-treatment now lead to a speedy termination of an uneventful convalescence (Case 24) and contribute in a large measure to the preservation of the residual hearing (Case 15). A maximum of residual hearing is to be attained after operation if the tympanum is allowed to cease secreting

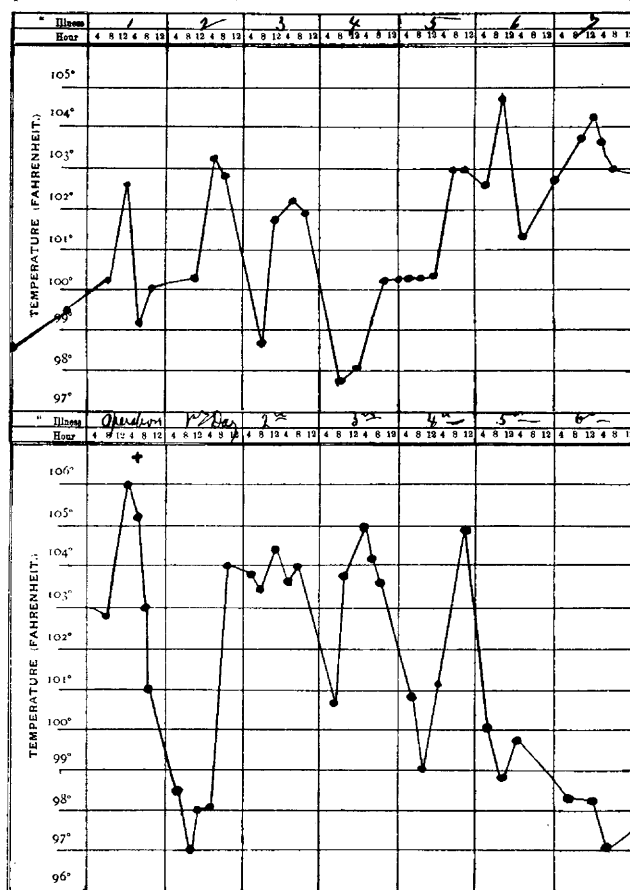


Chart 2.—Case 2.

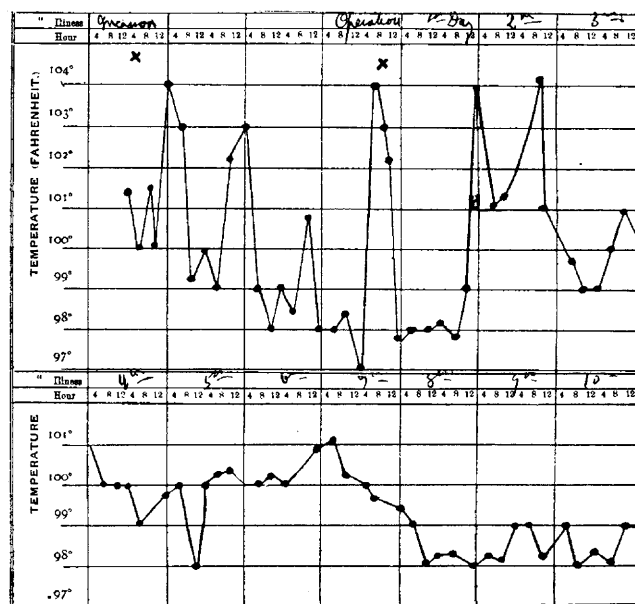


Chart 3.—Case 3.

before the postaural drainage is cut off, as this allows the sound-conducting mechanism to heal somewhat more quickly than by the reverse method.

15. The recent improvement in technic and the consequent rapid convalescence with a larger amount of resid-

ual hearing and no deformity justifies still earlier recourse to operative measures than formerly, which in the future will still further improve the statistics.

SUMMARY.

Following is a summary of the means and measures which encourage earlier operations with the hope of prolongation of life, a shorter convalescence and lessened expectation of a secondary operation, while they make the outlook favorable for more efficient hearing and absence of deformity: 1. Complete operation. 2. Use of efficient bone instruments and curtailment of useless polishing of the bone. 3. Rational disposal of the soft parts. 4. Preservation of the sound-conducting mechanism in selected radical cases. 5. Ligation of the jugular vein as high up as infection will allow before opening sinus and exenteration of the jugular bulb. 6. Management of brain abscess by the open method. 7. Blood clot, drained blood clot and my modification of the drained blood clot in the simple mastoid operation. 8. Reik's "protective sheet." 9. Blood clot in cases of epidural abscesses. 10. Cosmetic results of the blood clot, drained blood clot and evened-up bone wound. 11. Lessened shock and jar. 12. Shortened convalescence. 13. Elimination of secondary operation. 14. Avoidance of accumulated cicatricial tissue to interfere with the sound-conducting mechanism.

The 25 tabulated cases are the consecutive series of my recent operations on the mastoid region, arranged in order of severity of their postoperative constitutional symptoms:

DISCUSSION.

DR. A. H. ANDREWS, Chicago, said that those who have opened the lateral sinus and seen the freedom with which blood comes from the jugular bulb should have little fear of anything floating in that direction. While he has no objection to ligating the jugular previous to opening the lateral sinus, he can not advocate it for the reason Dr. Bryant gives. He has had some experience with the blood clot method of dressing, but it has not been satisfactory. It is true that the packing method does not always give entirely satisfactory results, and he will make further experiments with the blood clot method, although in some of the cases in which he has used it he has not been pleased heretofore. The question of hearing following these operations is important. The operations regarding the question of hearing may be divided into two classes: The simple, in which an effort should be made to get perfect hearing, and the tympanomastoid, in which, while perfect hearing can not be obtained as good hearing as possible should. The more perfect the drainage in the simple cases the more likely will perfect conditions in the middle ear be obtained. Dr. Andrews is satisfied that some physicians who are doing drainage operations do not appreciate the importance of letting the forward part of the antrum and the attic alone—of not probing the attic. He has known of the ossicles, especially the incus, being displaced by probing the antrum. When the incus is displaced it can not be expected that perfect hearing will follow the mastoid operation. If the best hearing possible is to be obtained in the radical operation, care must be taken not to allow granulation tissue to form over and about the stapes and the oval window. He considers that to be the most important thing in the after-treatment of the radical operation.

DR. CULLEN F. WELTY, San Francisco, said that every man can operate best with his own tools. He does not approve of the burr in the mastoid operation for the following reasons: The burr can not be controlled as well as the chisel, and heat comes from the friction. He has seen very few burr operations. He has seen the facial nerve severed by a slip. He also knows of a patient whose brain was punctured by a slip. He has never seen the facial nerve cut by the chisel, nor has he seen the chisel accidentally put into the brain. He thinks that the burr is particularly useful to smooth

rough edges of a mastoid cavity. The granulations are not so large and they heal much better. He can not speak with confidence or enthusiasm of the blood clot dressing. He does not think it is a surgical procedure, and believes that better results can be obtained by other methods. He is familiar with the blood clot dressing for the radical mastoid operation, but does not think it practical, because the granulation tissue must be taken care of. The amount of granulation tissue in a recent operation depends largely on the looseness or the tightness with which the tampon is applied. The hearing following acute mastoid operations should not be affected. After late operations it is apt to be somewhat lessened. This is not dependent on the operation, but is dependent on organized connective tissue which binds down the stapes, permanently impairing hearing. For this particular reason it is conservative surgery to operate early in acute mastoid cases. The hearing following radical operation is usually benefited, especially when dependent on the impairment of the conduction apparatus which can be removed.

DR. E. B. DENCH, New York City, said that he believes that every man will use the instruments he is accustomed to and do better than with some new device. Dr. Dench has always used the mallet and chisel. He has given the blood clot dressing a trial, and in every case in which he has used it, and he has used it by all methods, the wound has broken down and it has been necessary to reopen and drain. The procedure is unsurgical; that cavity can not be cut off from the air. The blood clot method was introduced first by Schede in Germany in treating osteomyelitis of the long bones in particular. Dr. Dench has taken pains to question some of the general surgeons, and finds that the method is in disrepute, even in osteomyelitis of the long bones. He has tried to get from some of the men using this treatment definite statistics regarding the actual number of cases in which the wound has been absolutely closed and a good result from the blood clot obtained. Dr. Dench declared that he can not conceive of proper drainage in the radical operation without doing a plastic operation on the auricle. A certain number of patients will get well without, but a large proportion will not. He has had to reoperate on some patients, in whom the operation had been perfect except that the meatus was small, but as soon as he made a proper meatus the ear became dry. Dr. Dench does not think that ligation of the jugular vein before opening the sinus is necessary. He has seen a portion of the clot below the level of the facial vein, and in that case the infection is not cut off at all unless the jugular below the level of the facial vein is tied and the facial vein as well.

DR. PHILIP HAMMOND, Boston, said that in all operative procedures the question of paramount importance is not the production of as little scar as possible, or making the treatment of short duration, but of what measures will be safest for the patient. It seems to him that the immediate closure of the mastoid cavity, as has been advocated, can but lead to disaster sooner or later. It is true that many satisfactory results have been reported following the blood clot dressing, but those who see bad cases which come to the hospital, in which within a few days after the operation there is a rise of temperature and a question of deeper infection, know how useful it is to have a clean wound where the changes in the bone can be seen and the sinus readily reached. Some ten years ago Dr. Hammond saw several radical operations in which a partial flap was made on the meatus, and subsequently the dressings were left out. The result, in one case in particular, was that the meatus practically reformed, closing off the mastoid cavity, and a chronic suppurative condition still exists inside the temporal bone.

DR. F. B. SPRAGUE, Providence, R. I., said that as Dr. Bryant mentioned his name in reference to the blood clot in radical operations, he would tell how it is done. It is not a blood clot operation according to the recommendation of Schede.

That is impossible under the disarranged anatomy. Dr. Sprague's technic is as follows: After complete exenteration of the structure, the canal flap being made according to the choice of the surgeon, the opening of the meatus is made large enough to admit of a half-inch pure gum drainage tube, which

is inserted as far as the facial ridge. A piece of round gauze wick covered with rubber tissue is then placed through the drainage tube along the remaining bony canal to the inner wall of the tympanum, then the whole remaining space is allowed to fill with blood and the mastoid incision closed to unite by primary union. The dressing is applied and left till the third day, when the wound is examined and, if in good condition, the new dressing is applied. The dressing near the tube will be wet with blood serum, but this is no indication for disturbance; should there be pus, however, it should be changed. On the fifth day the wick from the canal is removed and renewed. The seventh or eighth day the tube is removed and the cavity carefully wiped dry and packed closely, but not tightly, with gauze made in small tampons. This packing is repeated every day or two till epidermization is complete. Should the clot break down the cavity is irrigated with saline solution and tamponed as usual with small pieces of sterile gauze. If the blood clot fails, we save at least a week of painful dressings by the use of the rubber tubes and also have a good opening to pack through. This opening contracts after a while and the patient has a symmetrical canal mouth not as conspicuous and unsightly as the usual angular cuts.

Dr. Sprague said that he showed a patient in Boston, at the meeting of the Laryngological, Rhinological and Otological Society, three weeks from the day of operation, which was a splendid success, and he has done two other operations with equally good success. In the vast majority of cases, perhaps, the circumstances do not permit of such treatment. Wherever the blood clot can be used it helps to fill the cavity, gives a smaller space, and quicker healing is obtained, with less inconvenience to the patient.

Dr. KASPAR PISCHEL, San Francisco, suggested the use of lampwicks for cigarette drains instead of gauze. If a lampwick and a gauze drain be placed in a glass of water it will be seen that the lampwick drains much better.

Dr. O. H. REIK, Baltimore, said that he was sorry it is so hard to show Dr. Dench the error of his way, although Dr. Reik appreciated the conservative attitude he takes in the matter. It is perfectly proper that those who operate with the blood clot dressing in mastoidectomy should be required to demonstrate that this is a perfectly safe procedure. Dr. Reik said that he can not permit the statement that it is an unsurgical procedure to go unchallenged. He tried to show recently, in a paper published in *THE JOURNAL* of the American Medical Association, March 31, 1906, page 935, some reasons from the standpoint of the physiologist and bacteriologist why it is a perfectly scientific procedure. Physiologists have proved that the normal human blood is actually bactericidal. Perhaps an open cavity can not be better cleansed than by placing in it normal human blood which is capable of overcoming a certain number of micro-organisms. Dr. Dench stated that the Schede operation in osteomyelitis is in disrepute. Dr. Reik would rather say it is in disuse. Nothing has been brought out against it. It is in disuse, perhaps, mainly because success with the blood clot operation in the long bones requires an enormous amount of work. The surgeon must approach absolute cleansing of the wound and get out all the carious bone, to prevent infection and breaking down of the clot.

Dr. J. F. BARNHILL, Indianapolis, said that he would have to take ground against the blood clot operation. One reason is, that whereas this operation is done for the purpose of getting rid of pus and septic material which has formed in the mastoid, it is also done for the further purpose of draining the middle ear cavity and of preserving the hearing apparatus in its best condition as to function. He considers the latter one of the important reasons for doing mastoid operation early. It has been his experience, and that of many others, that when postauricular drainage is provided early, as in mastoid operation, the rupture in the drum membrane heals rapidly, pus ceases to flow from the middle ear at once, and in a short time after the operation the ear becomes almost normal in every respect. When a blood clot is left to fill the mastoid wound, the drainage from the middle ear is thereby blocked, and consequently the middle ear must continue to drain through the opening in the drum membrane, and do dam-

age to the ossicles and mucous membrane contained in that cavity. He therefore considers the presence of a blood clot in the mastoid wound a hindrance rather than a help to mastoid surgery.

Dr. C. J. BLAKE, Boston, said that the first case in which he used the blood clot dressings was one of acute mastoiditis following acute middle ear trouble, in a musician, to whom hearing was very valuable. In that case he did the crescentic cut of the drumhead superior posteriorly, in order to save the membrana vibrans with reference to future hearing, and did the mastoid operation. The cavity was allowed to fill with blood clot, the lips of the wound were closed by apposition and pressure pads of gauze. It was early in his experience with the blood clot dressing, and it was his custom at the end of forty-eight hours to slit up the wound with a blunt probe, a Bowman's probe preferably, putting the tip of the probe into the antrum and slitting the wound from top to bottom, thus making a division of the formed blood clot and providing the necessary drainage from the antrum. At the end of forty-eight hours the patient had a rise in temperature, suggesting the probability of an infectious process in the middle ear. On examination the edges of the wound were in complete apposition and there were no signs of redness, swelling, or other disturbance in the mastoid. The next day there was a small red spot on the top of the patient's head. The erysipelas ran its course, well over the head, and finally disappeared, the mastoid wound being left untouched, under the circumstances. At the end of five or six days, the erysipelas having passed, the mastoid wound was well apposed, healing had taken place, and not only was the mastoid closed, but the opening in the drumhead had closed also. Tests made six weeks later gave the patient 90 per cent. of normal hearing in that ear. If this can be accomplished, as it was under conditions of accident, why, he asked, should it not be made as nearly as possible, with proper exceptions, a natural and general rule?

Dr. W. SOHIER BRYANT, New York City, said that he has not seen any excessive granulations after the use of the blood clot. In regard to Dr. Dench's remarks about the blood clot and avoidance of packing in certain cases, Dr. Bryant thinks that there was a slight misunderstanding in the use of the word blood clot. He did not know how to use it so that Dr. Dench would understand exactly his meaning. He used the term simple blood clot, referring to wounds wholly closed by blood, and the term modified clot, referring to wounds only partially filled by blood clot. As to the size of the meatus following the omission of the packing after radical operation, he usually gets a meatus slightly larger than normal.

Dr. Bryant said that his method differs radically from that of Dr. Sprague. Dr. Bryant lets the wound close entirely, lets it collapse, the anterior soft parts falling back into the osseous excavation; and he uses a small amount of gauze in the meatus. He may or may not slit the meatus. The wound is dressed every day to make sure that it is all right. If the meatus looks dry after twenty-four hours, the gauze is left in twenty-four hours longer. If it is moist the gauze is removed and not replaced. The Blake blood clot is the simple blood clot without drainage. Dr. Bryant thinks that the drain blood clot is useful in more cases than the simple clot, because it is safer. A small cigarette drain, left in the bottom of the wound for not more than twenty-four hours, gives good drainage from the depths, as shown by the flow of serum which lasts several days after the removal of the drain.

Provisions for War Prevent Provisions for Prophylaxis.—A rather sensational episode at the International Antituberculosis Conference, which recently closed its sessions at The Hague, was the statement made by the delegate from France that the millions which his country wanted to spend on works for social defense against tuberculosis and the like she had been compelled by diplomatic exigencies to devote to the purchase of cannons and munitions of war. This undisguised appeal for universal peace was warmly applauded.