

ONE UNITED STATES GALLON CONTAINS:	
Solids.	Grains.
Sodium chloride	13,048.59
Magnesium chloride	1,390.78
Calcium chloride	3,261.18
Sodium bromide	86.95
Calcium sulphate	33.24
Iron carbonate	4.46
Silicic acid	.47
Aluminum	Traces.
Potassium	Traces.
Total	17,825.27

Specific gravity at 62° F. (16.6° C.), 1.205.
Weight of one United States gallon of the water, 70,273.19 grains.
Reaction, neutral before and after boiling. Filters clear and colorless.

The analysis shows this to be one of the most heavily mineralized waters known. A bath-house for the local use of the water has been erected on Maple Street, opposite the Northern Hotel, and the water is also used commercially. For internal use it is recommended in very small doses, from one-half to two teaspoonfuls four times a day, diluted with plain water. It is said to act as an emetic or as a purge if taken too strong.

The water is recommended for numerous internal disorders, and also for its local effects in ulcers, cuts, burns, or bruises; as a lotion in conjunctivitis, as a gargle in pharyngitis, as an injection in leucorrhoea, gonorrhoea, etc. The hot baths are stated to be of decided value in old cases of obstinate rheumatism. The water is odorless, and it is said that it never freezes at any temperature known in Michigan. *James K. Crook.*

CLARK'S RIVERSIDE MINERAL SPRINGS.—Wayne County, Michigan.
Post-Office.—Detroit.

This resort is located on Fort West Street, corner of Clark Avenue, about two miles from the centre of the city of Detroit. It is reached by electric cars, which pass the door of the bath-house every five minutes. This bathing establishment, which was recently opened to the public, is one of the most elegant and luxurious to be found in the country. The springs are two in number, and furnish an abundant flow of water. An analysis by Samuel P. Duffield, M.D., Ph.D., made in November, 1889, resulted as follows:

ONE UNITED STATES GALLON CONTAINS:	
Solids.	Grains.
Sodium chloride	3,408.50
Potassium chloride	.18
Calcium chloride	860.00
Calcium sulphate	1,790.98
Magnesium sulphate	1,032.02
Magnesium carbonate	11.22
Calcium carbonate	149.16
Silica	3.50
Alumina	13.41
Total	7,318.97

Sulphureted hydrogen gas, 40.76 cubic inches.
Temperature of water, 56° F.

The bath-house is kept open all the year. The waters have been found very useful in the diseases to which the saline-calcic class is applicable. *James K. Crook.*

CLASTOTHRIX. See *Atrophia Pylorum Propria.*

CLAVICLE. See *Shoulder.*

CLAVICLE, SURGERY OF THE.—The clavicle may be congenitally absent or partially defective. It may be deformed in rickets and osteomalacia, or as a consequence of badly united fracture. Fracture of this bone may occur *in utero*.

Diseases of the clavicle are rare. The principal ones noted are syphilis (gumma), tuberculosis, and osteomyelitis; with resulting periostitis, osteitis, abscess, caries, or necrosis.

Neoplasms of the clavicle are seldom met with. The variety of new growth most often seen is some variety

of sarcoma. Carcinoma is much more rare and its occurrence as a primary growth appears somewhat doubtful. Osteomata (exostoses) and enchondromata are seldom reported.

Traumatism may cause contusions, wounds, fractures, or dislocations. Wounds and contusions require no special mention. (See special articles on *Fractures* and *Dislocations*.)

The diseases and neoplasms of the clavicle present no clinical features peculiar to this bone. In syphilis, treatment with mercury and iodide of potassium should be thorough, and if portions of bone die they should be removed. Tuberculosis is apt to begin here in the periosteum, and the sharp spoon should be employed to remove the foci as thoroughly as possible, especially if suppuration threatens or actually takes place. When suppurative osteomyelitis is recognized, an incision should be made over the affected area, and after raising the periosteum the affected portion of bone should be chiselled or scooped away and the resulting cavity drained. Abscess, as elsewhere, requires incision and drainage and the removal of any dead bone.

Compound fractures, particularly if caused by pistol or rifle balls, require a thorough examination and disinfection under an anesthetic. One may decide also to keep the fragments in apposition by sutures, or to excise the whole or a part of the clavicle. The question of suturing simple fractures of the clavicle is still unsettled. When there is marked deformity, and particularly when sharp fragments appear likely to cause damage to important vessels or nerves in their neighborhood, the operation has some warm advocates.

The principal operative procedures on the clavicle are suturing, or wiring for fracture or dislocation; curetting, for tuberculous or syphilitic foci; incision, chiselling, etc., for osteomyelitis or removal of necrotic fragments; excision of the clavicle, partial or total; and temporary resection. The formation of a clavicular pseudarthrosis, for the relief of ankylosis of the scapulo-humeral articulation, has been suggested by Tillaux.

Excision of the clavicle, whether partial or total, may be done beneath the periosteum or outside it. Nearly half the cases of total extirpation of the clavicle collected by Norkus were for "necrosis" or "caries." When operating for these diseases, for fractures, or for benign new growths, the subperiosteal method should be employed. Where it has been made use of, restoration of the bone has taken place to a considerable extent or has been complete in the majority of cases, and the functional result was excellent or perfect, while in some there was no apparent deformity. An incision is made from one end of the clavicle to the other, extending through the periosteum, which is then detached from the bone with an elevator. The clavicle is then disarticulated at either extremity first, as may be most convenient; or it is divided at some intermediate portion and the two extremities are separately released from their attachments and removed. Care is to be exercised not to injure the large vessels adjacent to the sterno-clavicular articulation. It may be necessary to prolong the incision beyond either joint, or to make smaller transverse incisions at either extremity of the wound in order to gain better access to the articulations. When the disease process has separated the bone from the periosteum, it may be possible to extract it through a fistulous tract, or through a small incision dividing the skin and periosteum at a suitable point. Partial excision of the clavicle, removing more or less of the outer or inner extremity or a portion of the middle of the clavicle, may be performed for partial affections of the clavicle in non-malignant diseases. For sarcoma and other malignant new growths, neither the partial nor the subperiosteal method should be resorted to. In the thirty-two cases of extirpation of the clavicle for tumors (sarcomata in twenty-four instances) collected by Norkus, six deaths from the operation resulted. The incision is the same as in the subperiosteal operation. The cutting must always be done toward the periosteum, the attachments of the muscles should be

carefully severed from it, and the bone should be removed either in fragments after cutting or sawing through it, or as a whole, including the new growth. The wound is to be closed by suture after the divided sterno-cleido-mastoid and trapezius above have been carefully united by deep sutures to the pectoralis major and deltoid muscles below.

Madelung advocates temporary resection of the clavicle to give access to the subclavicular region. He recommends the division of the clavicle in its inner third, together with the subclavian and both pectoral muscles, in order to separate widely the divided ends of the clavicle. This gives free access to the subclavicular space and even to the axilla. The clavicle is divided obliquely from above and within downward and outward, in order that the subsequent adaptation of the parts, when the wound is closed, may be more perfectly secured. The pull of the sterno-cleido-mastoid muscle and the weight of the arm are better opposed by the adoption of this plan than if we resort to the straight backward division of the clavicle.

The operation is proposed for the purposes of gaining access to the subclavicular nerves and blood-vessels, of extirpating subclavicular and axillary neoplasms, of attacking diseases of the upper ribs, and of reaching the apices of the pleurae or lungs.

William G. Le Boutillier.

REFERENCES.
Norkus: Beiträge zur klin. Chir., xl, 725.
Madelung: Beiträge zur klin. Chir., xiv., 220.

CLAVUS. See *Callositas.*

CLEAR CREEK SPRINGS.—Bell County, Kentucky.
Post-Office.—Pineville. Small hotel.
Access.—Via Cumberland River and Tennessee Railroad, which connects with the Louisville and Nashville Railroad at Pineville, a distance of three miles from the springs.

The location of the springs is in the Clear Creek valley, almost entirely surrounded by mountains. The elevation is about thirteen hundred feet above the sea level. This region possesses many advantages in the way of charming scenery, exhilarating mountain air, etc. The springs in use are two in number, possessing about the same general characteristics. The following analysis was made by Robert Peter, State Geologist of Kentucky, in 1883:

ONE UNITED STATES GALLON CONTAINS:	
Solids.	Grains.
Calcium carbonate	2.07
Magnesium carbonate	Traces.
Calcium sulphate	.33
Magnesium sulphate	1.43
Calcium chloride	.16
Sodium carbonate	1.84
Silica	.51
Alumina	Traces.
Total	6.34

The water is said to be remarkably pure and well adapted to the uses of the table. We are informed that it has long enjoyed a considerable reputation in dyspepsia, liver and kidney affections, skin diseases and disorders of the female pelvic organs. *James K. Crook.*

CLEAVERS. See *Rubiacea.*

CLEFT PALATE.—By cleft of the hard and soft palates we mean a fissure of greater or lesser degree existing in the roof of the mouth, including, it may be, the alveolar ridge in front, and extending back to the extreme end of the uvula. These clefts are of two kinds, congenital and acquired, the former being by far the more frequent.

PATHOLOGY.—As to the congenital form, nature does not complete her work as originally intended, and while we can consistently indorse the views of those who think the defect to be entirely due to the want of a meat diet and

of sufficient phosphates of lime on the part of the mother, still there are many other factors to be considered.

H. E. Dennett, D.D.S., of Boston, has stated that "all flesh-eating animals take as much of the bone with the flesh they eat as they can break with their teeth sufficiently fine to swallow, and all have good dental organs."

Several years ago the lions in the Zoological Gardens of London were fed upon flesh containing too large bones for them to break and swallow. The young born while this method of feeding was pursued, it was observed, had cleft palates and lived but a short time. The lions were then fed upon small animals, whose bones they could break easily, and the young born afterward had perfectly formed palates.

It is safe to assert that the same causes which produce rickets in children have also a like effect in producing cleft of the hard palate. Hereditary tendency has been mentioned by some authors, and this I have observed in the history of some of my own cases.

Mr. Lawson Tait, F.R.C.S., in his paper on "Cleft Palate," has very briefly, in somewhat different words, referred to this pathological condition, and is very strong in his belief that in certain localities it is quite endemic, and that, in his experience, heredity had been a great factor. He says he has known cleft to miss as many as three generations, and then appear in an hereditary form.

The late Dr. Gurdon Buck has reported a number of interesting cases of hereditary cleft occurring in his practice, upon which he operated with success.

I lay much stress upon asking the parents questions bearing upon these points.

Intermarrying is an element to be considered in the study of the pathology of these cases (see Ferguson's "Surgery").

In a majority of cases in which the fissure is single, it is to be found on the left side, and the deviation of the two segments of the alveolar circle is fortunately, in these cases of single split, seldom great. My experience has been that in double fissure through the alveolar ridge, the vomer often has its only support below in the intermaxillary projection, that is, the intermaxillary bone or bones appear as an appendage to the vomer, being held or assisted in position by fibrous, cartilaginous, and mucous tissues. This island of intermaxillary bones and tissues, which is so very noticeable in double harelip, especially when associated with double split or fissure of the alveolar circle, has been a source of deep study to histologists as well as to pathologists. The former have spoken of it as analogous to the premaxillary bones in some of the lower animals, and yet it has been very difficult to detect, in the youngest fetal human upper jaw, the differ-

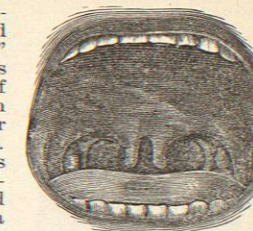


FIG. 1361.

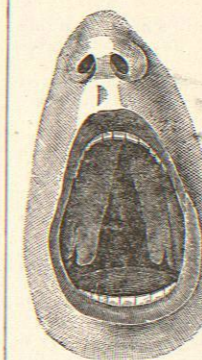


FIG. 1362.

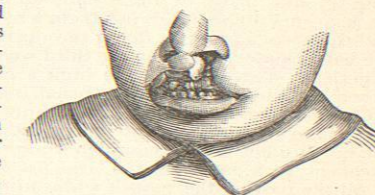


FIG. 1363.

ence between the intermaxillary portions and the lateral or true portions of this bone. However, we know that this so-called island does contain what may be termed the true intermaxillary bones and the temporary and permanent incisors, in cases of complete double



Fig. 1364.

ation the structure of this island or the intermaxillary substance, in determining the line of treatment to adopt.

Cleft of the hard palate, as well as harelip directly through the mesial line of the intermaxillary bones and soft parts, is very rare.

Tait says two specimens are known. I have seen one case of median harelip. Sir William Fergusson states that he has never seen a case.

Maternal impressions are often suggested as a cause of this deformity. We can give but a very slight indorsement to this view of the question.

Congenital cleft of the hard and soft palates may be exceedingly simple, only the uvula, as seen in Fig. 1363,* being implicated, or it may, in different degrees, be confined to the soft palate, or it may extend forward to, or into, the alveolar ridge (Figs. 1362 and 1363), or finally, it may double-fissure the alveolar circle (Fig. 1364).*

The fissure is oftener situated in the roof of the mouth, so that the vomer is to be seen in the middle of the split (Fig. 1364).*

At times the vomer is fastened to one or the other side (Fig. 1365),* generally to the left, and this location of it is always a source of embarrassment in operating. It is here that a combination of the Fergusson bone operation and the Warren operation—the former on the side free from the septum, and the latter on the opposite side, sliding the periosteal flaps—meets the emergency best. To break the vomer, as I did in some of my earlier cases, is not always a success, and we are more likely to get necrosis, especially of the septum.

It is well known that many infants born with this defect die within a short time after birth, when the cleft is of a marked character. Mr. Tait says that one-half of the children born with extensive clefts die within a few days after birth from starvation, and thinks we might be able to save many of these children if we could help them to suck by early giving them a roof to the mouth, and therefore advocates doing the operation for closing the hard palate as early as the third week. My personal experience does not show so high a rate of mortality. When speaking of treatment, I shall refer to this again.

Children born with cleft palate cannot nurse, nor can they, in many instances, use the large rubber nipple of the nursing bottle with complete success. Mason, in his excellent work, mentions the large flat nipple, made so as to fill the roof of the mouth while nursing, as of great use.

When the children must be fed with a spoon, a great care devolves upon the mother or nurse. Among my cases I have the notes of two (a son and a daughter in one family) in which the mother, for nearly two years in

* From Mason, "On Harelip and Cleft Palate."

each instance, was obliged to give nearly her entire time to the care of the two children, as regards feeding, before they could help themselves. In neither of these cases was an early operation done for closing the double harelip. (Fig. 1363 shows condition of the son.)

Cases allowed to go on without interference beyond the second year are those that show the loss of voice and the nasal tone in so marked a degree. This often proves a source of great annoyance in after-life, keeping the possessor from society and from following a professional career. It is interesting, as we study the history of this subject, to note the views of different surgeons who have published their cases, as to the proper time for operation, especially in reference to the recovery of the voice.

I have now performed the operation so many times, in patients of from twenty months to nineteen years of age, that I am entitled to speak from experience, and am convinced that our most successful cases are those upon which we operate early, and before the child has made any great effort to speak. In fact, these cases should not be encouraged to talk early. Most children make an earnest effort to talk at the end of the second year, and by that time the operation should have been performed. From my own observations of the results obtained by other surgeons who have closed the cleft as early as the second or third month of infant life, and from my study of the literature of the subject, as well as from my personal experience, I am not in favor of going so far as this in the direction of early operating. Young children do not bear the loss of blood well, and although we may make use of the galvano-cautery knife to divide the tissues and thus avoid hemorrhage, yet the shock is such as to add to our mortality list, and, besides, union often fails in these early attempts. Of this, however, I am certain, that in all these cases of cleft palate complicated with single or double harelip, the operation upon the soft external parts should be done as soon after birth as possible. With the large nipple and perfect lips to surround it, or simply by the use of the spoon, the child can be fed very well. The union of the soft parts does aid, I am convinced, in bringing together the bony vault of the mouth, a result which is very desirable. Then again, it does to a certain extent carry the child out from the domain of idle curiosity and observation, and thereby lessens the burden of the parents. Some of these children will die before reaching the age of two years, not because of imperfect mastication, but because they are bound to bear their ratio of death with the rest of the infant family.

In double harelip, while the treatment of the island or intermaxillary bone has been dwelt upon very clearly by the various writers, I am sure that of all the different complications, it is in this that experience is of the greatest value, and that every case presents one or more peculiar features. To save the island when possible is, I think, good surgery. There can be no doubt that it prevents the child-like contraction or appearance which is so striking in some adult faces where it has been removed. I think the cases are few in which, in saving the island, the operator can go on and unite both sides in the same operation.

As to the manner of closing the single harelip, there can be little difference of opinion. The law is inflexible that to produce a good result the vermilion border of the lip must be always on a line projecting a little, if possible. If not, an apparent notching occurs in the vermilion border.

Regarding the mode of dealing with the island, my preference is, if I cannot save the bone, to save the



Fig. 1365.

healthy skin covering it, be it ever so small, and to shape it in such a way that by angle, curve, or square I can fit it either into, between, or to one side of the upper lip, using that to form flaps. The small portion thus saved aids in its way to give an appearance of fullness to



Fig. 1366.

the face or upper lip. In one of my cases, sent me by Professor Bigelow, of Albany, there existed that dreadful deformity, such as is seen in a small number of cases only, in which the island projected upward almost like a horn toward the nose. There was quite a surface of healthy skin covering it, and I determined to save it all. Accordingly, I first took from the septum, with curved bone forceps, a V-shaped portion of bone, and then broke the island into position on a level with the alveolar ridge of the upper jaw, holding it there for a period of ten days with compress and adhesive plaster. Two weeks later I freshened the edge of the fissure on the left side, also the edge of the skin covering the island, and then brought the flap or upper lip up to it, holding it there with two silver pins. Good union was obtained (see Fig. 1366). Two months later—the child being then not quite six months old—I treated the fissure on the right side in a similar manner, and got a perfect result. Unfortunately for the completion of the operation for closure of cleft of the hard palate, this child died of cholera infantum just at the end of its second year, and at a time when the parents were ready and anxious for the final operation.

The saving of the island gives a better septum for the nose, as is reasonable to conclude from a comparison of this case with another in which the island was removed. In the latter case, a boy six months old, there was a double harelip with the intermaxillary bone so prominent that it was deemed best to remove it entirely. At the first operation, when this was done, a lateral incision was made from the angle of the nose on each side outward into the cheek, and then the two flaps forming the upper lip were brought together; perfect union was thus secured. Later on, and in his second year, two operations were required for closing the cleft in the hard and soft palates; but his voice did not improve as I had hoped. I did not see him for nearly three years, when he was brought to me, and on examination I found that the upper lip had no union with the septum or vomer, and that through this opening the air escaped in so great a volume as partially to account for his defective speech. These cases are difficult to remedy.

In the case of a boy who was four years of age, and whose face was almost as much disfigured as was that of the case just narrated, I operated the same number of times, but I did not remove the intermaxillary bone. The result obtained, as to appearance and voice, was nearly perfect.

Just here I wish to speak of the necessity of operating upon the soft parts in such a manner as not to leave any scar behind. On this point Mr. Lawson Tait says: "To avoid these scars I use ordinary seamstresses' needles, strong, and threaded with a few inches of silver wire double. I introduce each needle through the lip (in the plane of its surfaces), about half an inch from the prolabium, and bring the point out at the middle of the cut surface. I then introduce the needle at the corresponding point of the opposite cut surface, and bring it out at the root of the ala of the nose. Thus, when both nee-

dles are *in situ* they form a St. Andrew's cross, the point of intersection being the centre of the wound. The needles are then pushed home up to their eyes, the wires twisted firmly together, the points cut off close to the skin, and the stumps retracted into it. Thus all possible scarring is avoided."

In my article on *Harelip* I shall speak more fully on this subject, having little reason to regret the use of the ordinary silver harelip pins.

In these operations I do not hesitate to make use of chloroform, and especially in children under ten years of age. Before it is given everything should be in readiness, and each assistant should be instructed as to his work; then, as the little one comes under the influence of the anæsthetic, the operation should be begun with promptness. It is true, many of these children are of feeble make-up, but the cases are few in which one need feel at all anxious in giving the chloroform from a small plain napkin, plenty of air being allowed.

The subject of cleft of the hard and soft palates is one not so well settled in the minds of surgeons as to exclude further elucidation, and, while it is hardly safe for one to attempt to advance much that is new, I am convinced that a more careful examination of our cases, and of the reports of the same, one, two, or more years after an operation has been performed, is needed. It will ever remain a source of regret to the profession that such successful operators as Warren and Fergusson (the latter operating over three hundred times) did not leave a record as to how the operation ultimately affected the voice, the restoration of which is the principal object sought for in doing so difficult an operation.

That it is a severe operation there can be no doubt, especially when the attempt is made to close a complete

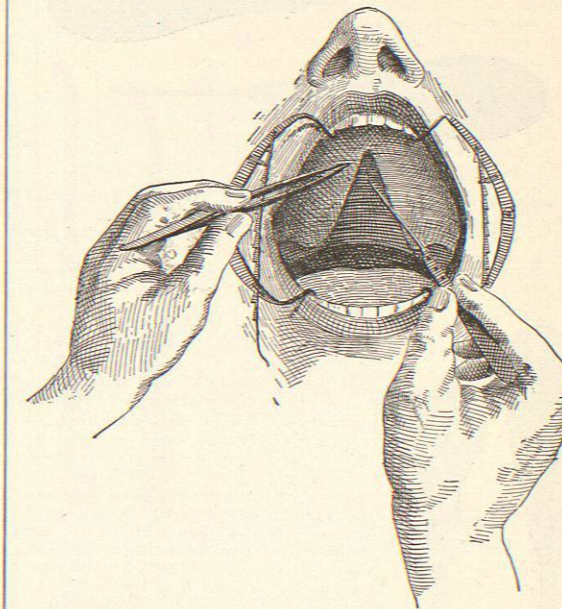


Fig. 1367.

cleft. In my own practice, furthermore, I have experienced repeated failures in a few cases. Nevertheless, in these very cases, with one or two exceptions, I have finally conquered, and in none was the patient left any the worse for the future trial of an obturator. That cases do get on in life without any operation being done, and are then improved by the use of an obturator, is now a well-established fact. However, these cases are not always so bene-