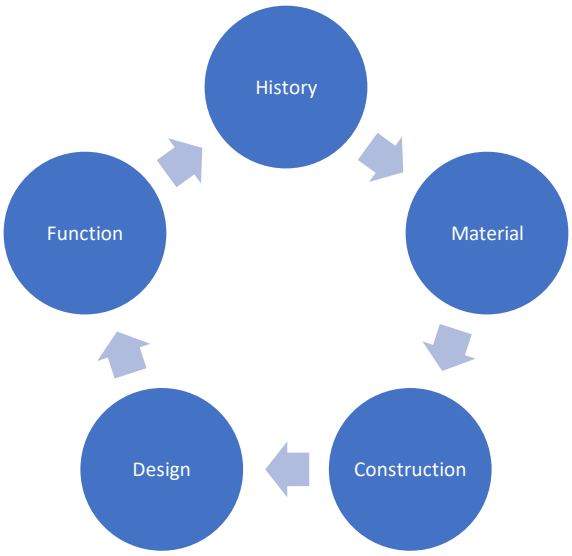
Tooth Key

How to use this folder for Object Study – 3 steps:

1) Complete **Object Study** as per 5 aspects listed below (see graphic below)
2) Explore the primary sources within folder as it relates to the selected object
3) Interrogate the selected object by using **Further Questions** (see back of page)

Object Study



1) History
   - When and where was it made?
   - By whom was it made? For whom was it made?
   - Why was it made?

2) Material
   - What is it made out of?

3) Construction
   - What techniques were used to make it?
   - Is it made well?
   - How are its parts organized to bring about its function?

4) Design
   - What is its physical structure? What is its shape?
   - What is its size and weight?
   - What is its style? Is it ornamented? How?
   - What, if anything, does it represent or resemble?
   - Does it have writing on it?

5) Function
   - For what use was it originally intended?
   - How has it been used over time?
   - What marks of its use are evident?

*Adopted from E. McClung Fleming, "Artifact Study: A Proposed Model," *Winterthur Portfolio* 9 (1974): 153-7.

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Further Questions * Many of these questions follow Stage 2: Four Meanings of an Artifact (Fleming)

1. Identify it: Has your research confirmed your original identification?
2. Evaluate it: Rank its aesthetic and functional qualities, considering the material, texture, skill of craftsmanship, effectiveness of overall design, the expressiveness of its form, style and ornamentation. Compare it with other, similar objects and within the same time period.
3. Is this object listed in contemporary instrument catalogues? Are there other related instruments also available for purchase? If so, how do comparative instruments differ in design or suggested function?
4. What does its function reveal about the philosophy of medicine and health at the time?
5. What does its function reveal about the relationship between science and medicine?
6. What does the location of its use reveal about the role of the doctor and the role of the patient in health and medicine?
7. How might the status, values and meanings attached to a practitioner of medicine, or to a patient, be conveyed by the object?
8. How and why does the legitimacy of the object, or the perception of its utility, change over time?
9. What is the history of the patent information? Who created or designed the object?
10. How did the use and connotations of the objects, or others like them, change the practice of medicine?
11. How do the accompanying primary sources enhance your understanding of the object? What themes or issues are represented in these external sources that are not presented in the object?

Key Themes to Consider:

- The professionalization of dentistry
- The relationship between dentistry and class
- The transition from barber surgeons to dental surgeons

Selected References for Further Research

Adams, Tracey Lynn. *A Dentist and a Gentleman: Gender and the Rise of Dentistry in Ontario.* Toronto: University of Toronto Press, 2000.

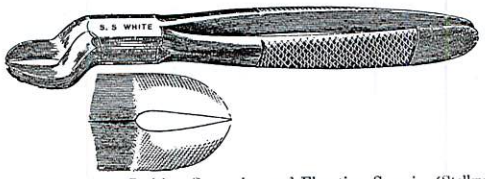
Garant, Philias. *The Long Climb: From Barber-Surgeons to Doctors of Dental Surgery.* Chicago: Quintessence Publishing Co., Inc. 2013.

Hosek, Lauren, Warner-Smith, Alanna L. & Watson, Cristina C. "The Body Politic and the Citizen's Mouth: Oral Health and Dental Care in Nineteenth Century Manhattan," *Historical Archaeology* 54, 1 (2020): 138-159.

Kenny, David J. & McKellar, Shelley. *Transforming Dentistry: The Rise and Near Demise of Dentistry at Western University.* Toronto: University of Toronto Press, 2022.

Tooth Key

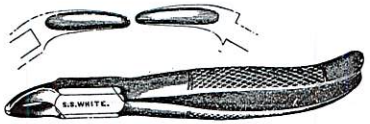
Picard, Alyssa. *Making the American Mouth: Dentists and Public Health in the Twentieth Century.* New Brunswick: Rutgers University Press, 2009.



No. 67—Combined Root, Incising, Separating, and Elevating, Superior (Stellwagen's).

CHILDREN'S FORCEPS.

Nos. 29 and 30—Children's Teeth, curved and straight.



No. 62—Children's, and Universal Root.

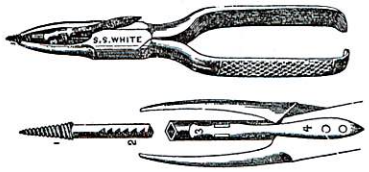
Plain Line Forceps.

We make a Plain Line of Forceps, with Crocus-polished Octagon Joints, which in material, form, and all useful qualities and properties, are the same as our best Forceps. In style, finish, and durability these are equal to the best of any other make on sale in this country.

This line is now extended until it includes all the numbers, sizes, and varieties of every kind of Extracting, Excising, and Splitting Forceps which we make; and it is our intention to keep it full.

Price per pair (except Nos. 29, 30, 62, 66, 67)	$2.60.	Nickel-Plated	$3.00
" " Nos. 29, 30, 62	2.40.	"	2.80
" " " 66, 67	3.00.	"	3.50

DUBS'S SCREW FORCEPS.



DESCRIPTION OF CUT.

1. Conical Screw with square Ratchet Shaft. 2 Beaks of Forceps, grooved inside. 3. Socket with square hole to receive Shaft. 4. Spring Trigger by which the Screw can be detached at pleasure, at any given point.

Price, Octagon Joint . . . . . per pair	$5.50
" " " Nickel-Plated . . . . . "	6.00

HULLIHEN'S SCREW FORCEPS

Price, Octagon Joint . . . . . per pair	$4.00
" " " Nickel-Plated . . . . . "	4.50

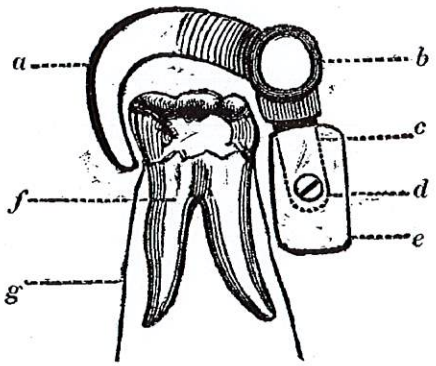
TURNKEYS.

Price, Ebony Handle . . . . . each	$2.50
" Ivory " . . . . . "	3.00

KEY FOR EXTRACTING THE TEETH.

To the Editor of THE LANCET.

SIR :—Having made improvements on the the key-instrument for extracting teeth, I wish to place before your readers an explanation of its construction and advantages. It consists of an oblong bolster, lever, shaft, handle, and claws. The shaft and handle resemble those of the other keys.



This plate represents the end of the instrument when adjusted for extraction. a, the claw; *b*, the head of the claw-screw; *c*, dotted lines showing the direction of the lever within the bolster; *d*, the head of the plate, or bolster-screw; *e*, the bolster, with its smooth surface towards the tooth; *f*, the tooth; *g*, the alveolar process.

The smooth surface of the bolster is to be applied naked to the gum; the claw is then to be turned over, and placed on the opposite side of the neck of the tooth, using the same motion of the hand and wrist as is employed with the other keys for extraction.

The advantages are, that it occupies less room in the mouth than the other keys, being used without a pledget or pad of any description; and the gums are not injured by its action. Owing to the firm and steady pressure of the surface of the bolster against the gum, and the length and ascending motion of the lever, the tooth is lifted perpendicularly from its socket. It is generally applicable to all descriptions of teeth.

The qualities that I have attributed to it, are drawn from the results of many hundred experiments performed on various teeth. I remain, Sir, your obedient servant,

R. O. MILLETT.

Hayle, Cornwall, Nov. 23, 1837.

CRANIAL BLOOD-SWELLINGS.

To the Editor of THE LANCET.

SIR:—In your Number for Nov. 25, there are some remarks of interest upon cranial swellings, by Mr. Wagstaffe; I cannot, however, agree with that gentleman in believing they occur without being "the result of *violence* or *parturition*." Some years ago the subject considerably interested my friend Mr. Callaway and myself, and in three cases we distinctly traced *each* to have been the result of accidental blows after birth. The swellings which appear to occur spontaneously soon after the birth of a child, I have been disposed to think, arise from the rupture of some vessel whilst the bones are overlapping each other *during the process of parturition*. The treatment recommended by Mr. Wagstaffe I consider very desirable, and I certainly should look upon opening these tumours as injudicious; at the same time, if the removal of the blood is not urged by proper measures, the bone does undergo a change from pressure, and may be productive of mischief; a specimen illustrative of this fact I possess, and shall be happy to show it Mr. W., or any gentleman interested in the subject. I remain yours, &c.

W. T. ILIFF.

Newington, Dec. 20, 1837.

LITHOTRITY.

REPLY OF MR. JEAFFRESON TO MR. DENHAM.

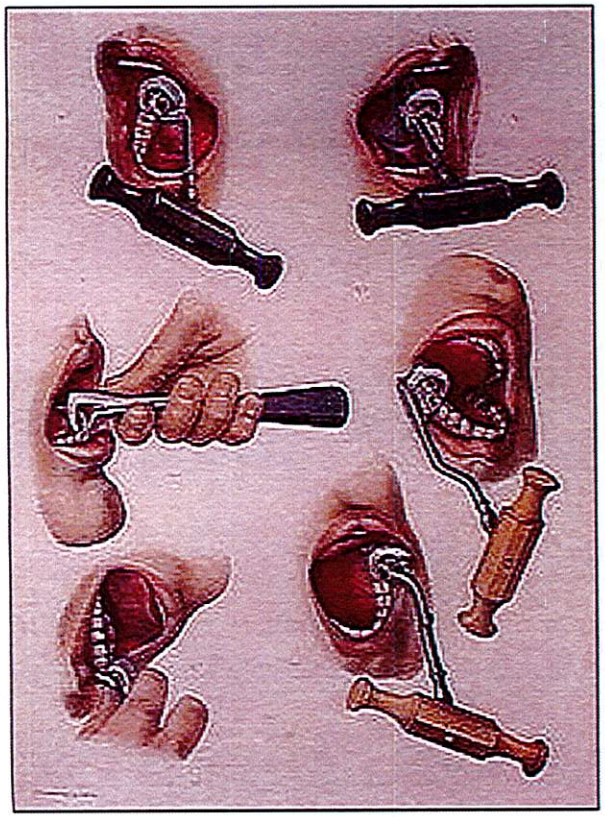
To the Editor of THE LANCET.

SIR:—In reply to the criticism of Mr. Wm. Hempson Denham, on my unsuccessful cases of lithotrity, I beg to state, that when Mr. Costello dismissed his patient, Smith, from town, he gave him the most judicious and scientific directions to prevent relapse; and it is only from Mr. Denham's extensive experience that we learn that future lithic deposit can be *certainly* prevented. The only reason why lithotrity was resorted to in this case was, that the patient would not submit to lithotomy.

Had Mr. Denham seen or examined Mr. Costello's urethral forceps, he would have had no difficulty in perceiving that the blades of that instrument might become so embedded in the substance of a fragment of a calculus, composed principally of phosphate of lime, as to prevent their expansion, and render futile any effort to disengage them.

To convince Mr. Denham that he might be mistaken in his prognostic of a fatal result in a case of lithotomy, accompanied by muco-purulent discharge from the bladder, I will mention that, many years since, Mr. King, of Saxmundham, lithotomised a patient who had so much of this discharge as to induce one of the surgeons of the *Norwich Hospital* to refuse to perform the operation, yet this person perfectly recovered. In these sad cases the decision must be left to the patient, whether he will submit to the only means which can give him a chance

Tooth Key Extraction



Photograph illustrating tooth extraction by a tooth key. (c. 1892)

edge of the gaſtrocnemius, near the upper part of that muſcle.

Stamford,
October 6, 1795.

IX. *Deſcription of a new Key Inſtrument for the Extraction of Teeth. Communicated in a Letter to Dr.* Simmons, *by Mr.* J. Savigny, *Surgical-Inſtrument Maker in London.*

To Dr. SIMMONS.

SIR,

I BEG leave to preſent you an engraving of a Key Inſtrument, for extracting teeth, which I have lately invented, and in the conſtruction of which I have endeavoured, as much as poſſible, to combine ſimplicity with utility. The complaints I have been continually accuſtomed to hear of the pain and danger attending this operation, have long excited my attention, and have led me to conclude that ſomewhat

eſſentially

eſſentially deficient muſt have attended the conſtruction of the different inſtruments hitherto employed to effect it.

On comparing and reflecting on the various forms which the key inſtrument has received, I have ever found their principal defect to ariſe from the depth of the bolſter, which, even in the ſmalleſt, deſcribes in its action ſo large a circle (the ſtem or ſhank of the inſtrument being conſidered as its centre) as to occaſion unavoidable inconvenience; and in the larger or deeper ones certain danger of fracturing the alveolar proceſs, and of being followed by conſequences always painful, and frequently dangerous.

The violent effects of ſo powerful a fulcrum have uſually been increaſed by a curve or neck at the inferior extremity of the inſtrument, for the purpoſe of retaining its action in a right line with its handle, when employed in the extraction of the molares in the internal direction; an alteration which, although it effected its intended purpoſe, ſtill augmented the inconveniences I have ſtated to ſo great a degree, that I believe I may ſafely aſſert, it has uniformly produced, more or leſs, the pernicious conſequences mentioned above.

For an eſſential improvement in this part of the

the conſtruction of my inſtrument, I acknowledge myſelf indebted to a very intelligent and ingenious paper by Mr. Robert Clarke, of Sunderland, inſerted in your laſt volume *. I found it admirably calculated to aſſiſt the mechanical intention of the circular bolſter I have adopted, the action of which being confined to a revolution upon its own axis, gives ſufficient power for the extraction of the tooth, in nearly a perpendicular direction. A bolſter of this ſhape may be applied without violence to the proceſs, and by preſenting a regular obtuſe ſurface to the gum, leſſens the danger of bruiſing or laceration; while it affords, at the ſame time, a reſiſting point to the claw, in whatever poſition it may be engaged.

The conſtruction of this inſtrument will be beſt underſtood from the annexed engraving †, in which,

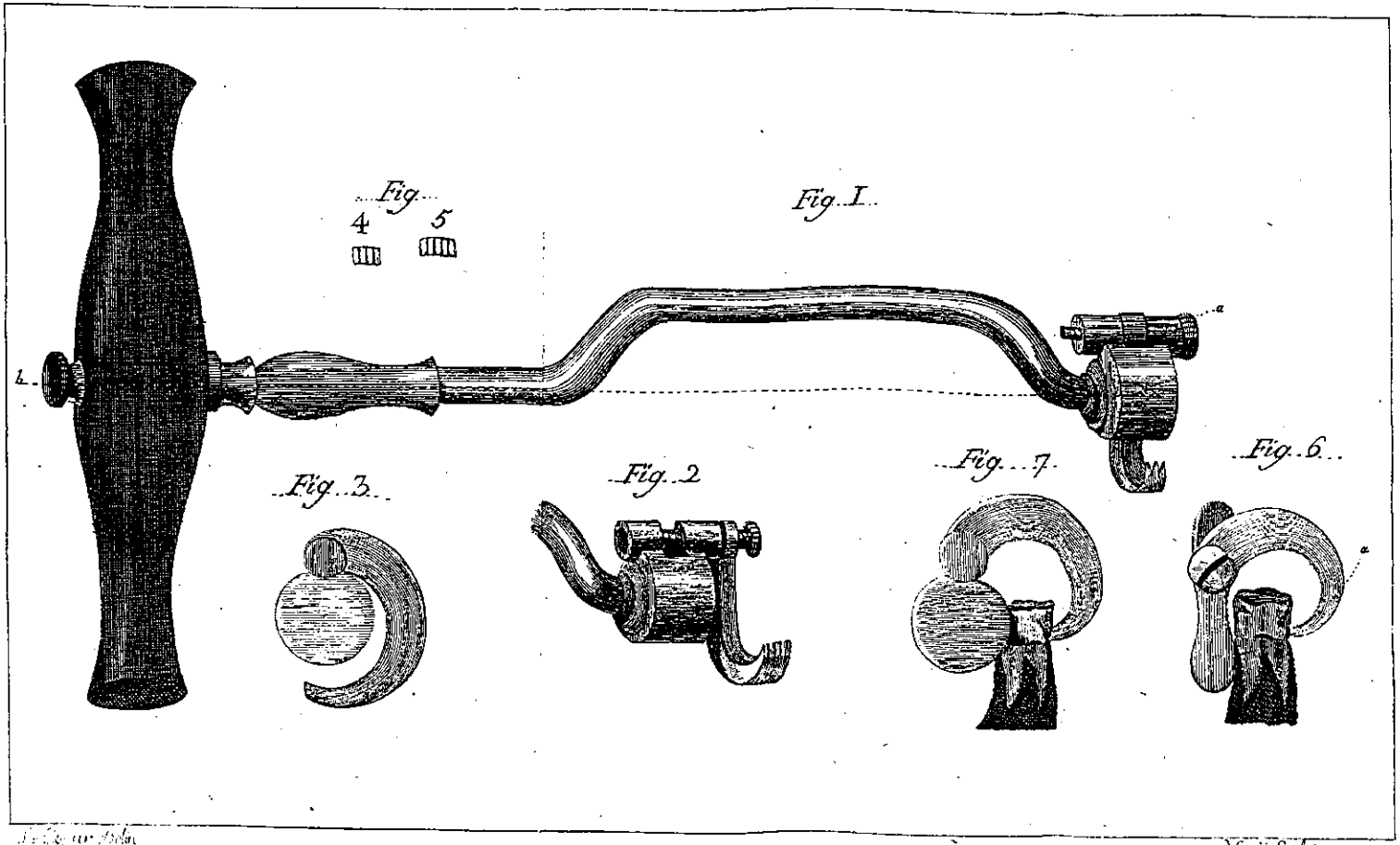
Fig. 1. repreſents the inſtrument of its proper ſize and figure; the dotted line is intended to ſhow, that notwithſtanding its advantageous curve, its action is perfectly central, and in a right line with its handle.

* Vol. VI. p. 120.

† See Plate I.

a refers

Medical Facts & Obs. Vol. 7. Pl. 1.



Hery Sculp.

a refers to a ſcrew with a milled head, retaining the claw :

b to another ſcrew with a milled head, ſecuring the handle, which, by this means, is eaſily wholly removed, to render the inſtrument more portable, or its poſition changed, (horizontally or vertically) as may be occaſionally required.

Fig. 2. ſhows the bolſter of the inſtrument, with the claw attached to the projecting extremity, for more conveniently fixing it on the dentes ſapientiæ.

Fig. 3. exhibits a front view of the bolſter, to ſhow its form and circumference.

Fig. 4. and 5. ſhow the dimenſions of the points of the claws, the only difference of ſize requiſite in this inſtrument.

Fig. 6. repreſents the bolſter and curved neck of the common inſtrument applied to a tooth. The dotted line, marked *a*, pointing out the direction of its action, renders any comment upon the conſequences unneceſſary.

Fig. 7. ſhows the bolſter and claw of the improved inſtrument alſo applied to a tooth, by which the comparative difference of the powers of the two inſtruments may be eaſily aſcertained.

The teſt of actual experiment having confirmed the advantages of this inſtrument, I ſubmit this account of it to your conſideration, and if thought worthy a place in your truly important and uſeful publication, its inſertion will be deemed a favour conferred on,

SIR,

Your moſt obedient

And very humble ſervant,

JOHN SAVIGNY.

King Street, Covent Garden,
May 23, 1796.

William Davidson
1812 - 1817

BRITISH DENTAL ASSOCIATION

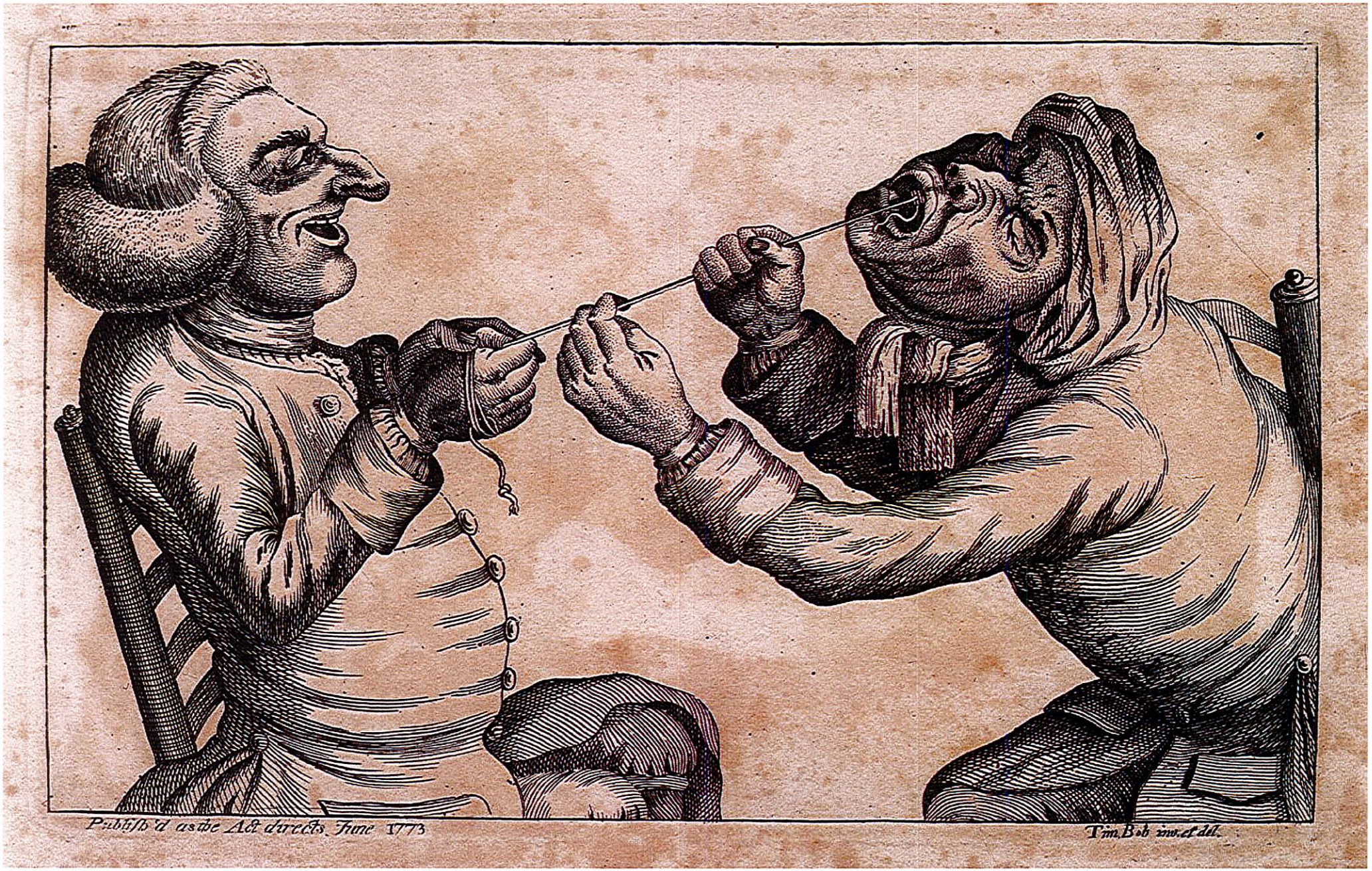
"TUGGING AT A (HIGH) EYE TOOTH" GEORGE CRUIKSHANK, 1821
BRITISH DENTAL ASSOCIATION

THE COUNTRY TOOTH DRAWER.

Printed and Published by W. Davison Alnwick.

William Davison
1812 - 1817

BRITISH DENTAL ASSOCIATION



WELLCOME COLLECTION
TIM BOBBIN (1708-1786), JUNE 1773

THE

PRINCIPLES AND PRACTICE

OF

DENTAL SURGERY:

BY

CHAPIN A. HARRIS, M.D., D.D.S.,

PROFESSOR OF THE PRINCIPLES AND PRACTICE OF DENTAL SURGERY IN THE BALTIMORE COLLEGE; MEMBER OF THE AMERICAN MEDICAL ASSOCIATION; AUTHOR OF DICTIONARY OF MEDICAL TERMINOLOGY, DENTAL SURGERY AND THE COLLATERAL SCIENCES, ETC., ETC.

SIXTH EDITION:

ENLARGED AND IMPROVED.

WITH

TWO HUNDRED AND FIFTY-SEVEN ILLUSTRATIONS.

PHILADELPHIA:

LINDSAY & BLAKISTON.

1855.

these organs. Here he will find full directions for the management of cases of this kind.

Fifth, all dead teeth and roots of teeth, and teeth which have become so much loosened from the destruction of their sockets as to be a constant source of disease to their adjacent parts, or teeth which are otherwise diseased, and are a cause of neuralgia of the face, a morbid condition of the maxillary sinus, dyspepsia, or any other local or constitutional disturbance, should, as a general rule, be extracted.

There are other indications which call for the extraction of teeth, but the foregoing are among the most common, and will be found sufficient, in most cases, to determine the propriety or impropriety of the operation. Cases are, however, continually presenting themselves, to which no rules that could be laid down would be found applicable, and where enlightened judgment, alone can determine the practice proper to be pursued.

In conclusion, it is scarcely necessary to say, that whenever a tooth can be restored to health, it should always be done, but tampering with such as cannot be rendered healthy and useful, and which, by remaining in the mouth, exert a deleterious influence, not only upon the adjacent parts, but also upon the general health, cannot be too strongly deprecated.

INSTRUMENTS EMPLOYED IN THE OPERATION.

Different operators employ different instruments. For about fifty years, the key of *Garengeot* was almost the only instrument used in the performance of the operation, but recently, this, in a great measure, has been superseded by forceps, which, when properly constructed, are far preferable; yet as the key is still used by some practitioners, it may be well to give a brief description of it.

KEY INSTRUMENT.

The common tooth-key may be regarded in the light of a wheel and axle; the hand of the operator acting on two spokes of

the wheel, to move it, while the tooth is fixed to the axle by the claw, and is drawn out as the axle turns. The gum and alveolar process of the jaw, form the support on which the axle rolls.—*Arnott.*

Different dentists have their keys differently constructed, yet the principle upon which they all act is precisely the same. Some prefer the bent shaft, others the straight. Some give a decided preference to the round fulcrum, others to the flat, and though the success of the operator depends greatly upon the perfection of the instrument, yet he can remove a tooth more expertly by means of a key with which he is familiar, than one to which he is unaccustomed, though its construction be even better.

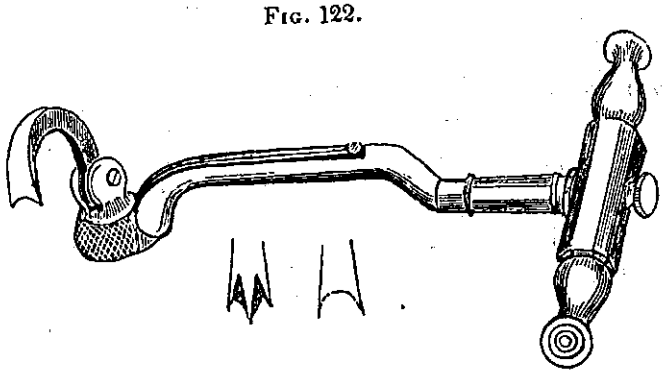
The author has tried almost every variety of key-instrument that has been used in this country, and he is of opinion that the straight shank with a small round fulcrum, is decidedly preferable to any other. The objection raised to its use by some, that it is liable to interfere with the front teeth, is without good foundation. It can be used with as much safety as a key of any construction, and, in most cases, can be as easily applied. The round is certainly preferable to the flat fulcrum, because it is less liable to injure the gums and the alveolus. Its size should be a little larger than a half-ounce bullet.

Every key instrument should be supplied with several hooks, differing in size, to correspond to that of the teeth upon which they are to be applied. The hook described by Dr. Maynard, in No. 3, vol. 3, of Am. Jour. of Dental Science, is preferable to any which the author has seen. It very nearly resembles the eagle's claw, except that its curvature is rather greater. The edge of the point is about the sixteenth of an inch in width, and divided into two points, by a shallow notch, filed in the centre. A hook of this description is much less liable to slip, and can be more readily applied to a tooth than those ordinarily used.

But with regard to the merits of the key instrument, compared with the forceps presently to be described, the author does not entertain a very poor opinion, or of any other instrument having the same principle of action. The following remarks

quoted from the late work of M. Desirabode, are in accordance with the views which he has held and promulgated for many years.

Fig. 122.



In treating of the causes of fractures of the alveoli, he says, "one of the most common, it is necessary to say it, although not a very flattering acknowledgment from our art, is a badly performed operation in the mouth, and if it is necessary to specify cases, we would not hesitate to quote, in the first place, the use of the key of Garengeot; for we shall prove, in treating of the extraction of teeth, that this *dangerous* instrument, which is only fit to mask the unskillfulness of the operator, to the detriment of the operation, is one of the most defective of surgical instruments, and that no practitioner of good sense, being convinced of its mode of action, would attempt to employ it if he wished to extract a nail from a hole, if he did not desire to break the wall."

FORCEPS.

Forceps were not very generally or extensively employed, except for the extraction of the front teeth, until about the year 1830, but the improvements that have been made in their construction, since that period, are so great, that their use has now, among dental practitioners, almost altogether superseded that of the key.

The forceps formerly used, were so awkwardly shaped, and

Fig. 122 represents a key instrument with a bent shank and two hooks, one for molar and one for bicuspid teeth.

badly adapted to the teeth, that the extraction of a large molar with an instrument of this description, was regarded as so exceedingly difficult, and even dangerous, that, previous to 1830, its practicability was doubted by many of the most experienced practitioners, and hence, the key was almost the only instrument resorted to for this purpose.

When we consider the strong prejudices that so recently existed to the use of forceps, it is not at all wonderful that their employment should have been admitted by the profession with caution. Nor is it surprising that a gentleman of Mr. Bell's intelligence and practical experience, should, so late as the period of the publication of his work, 1830, tell us that the key is the only instrument to be relied on for the removal of teeth that are much decayed, and that those who have heaped the most opprobrium upon it, are glad to have a concealed recourse to its aid.

This may have been true at the time Mr. B. wrote, but it is not now. On the contrary, cases are daily occurring of the extraction of teeth with forceps, upon which the key had been previously unsuccessfully employed. It is generally supposed, that a greater amount of force is necessary to remove a tooth with forceps, than with the key, but this is a mistake. It does not ordinarily require as much. All that is gained by the lever action of the key, is more than counterbalanced by the greater amount of resistance encountered in the lateral direction of the force exerted by that instrument in the removal of the tooth. But with the forceps, the direction of the force being perpendicular, either upwards or downwards, as the tooth may happen to be in the upper or lower jaw, a sufficient amount only to break up the connection with the socket, and to overcome the resistance of the walls of the alveolus, is required.

The author has used forceps, to the exclusion of the key, since 1833, and he does not hesitate to affirm, that any tooth that can be extracted with the latter, can also be removed with the former, if properly constructed, and that, too, in the majority of cases, with greater ease to the operator and less pain to the patient. He knows that, in this expression of opinion, he differs from many of his professional brethren; and

that there are many skillful and experienced practitioners, who, while they prefer forceps for the extraction of most teeth, still occasionally use the key. But he is confident, that, if they would provide themselves with forceps properly constructed for the extraction of the teeth, which they now remove with the key, and use them for six months, to the exclusion of that instrument, they would never employ it again. He could mention the names of more than fifty, who, at his instance, have done this, and the result has been, that they have wholly abandoned its use.

It may perhaps require a little more practice to become skilled in the use of forceps, than in that of the key. We would, therefore, advise those who have been accustomed to the key, not to lay it at once entirely aside; but to commence the use of forceps on teeth that are least difficult to remove, as for example, the bicuspids, and then afterwards upon the molars.

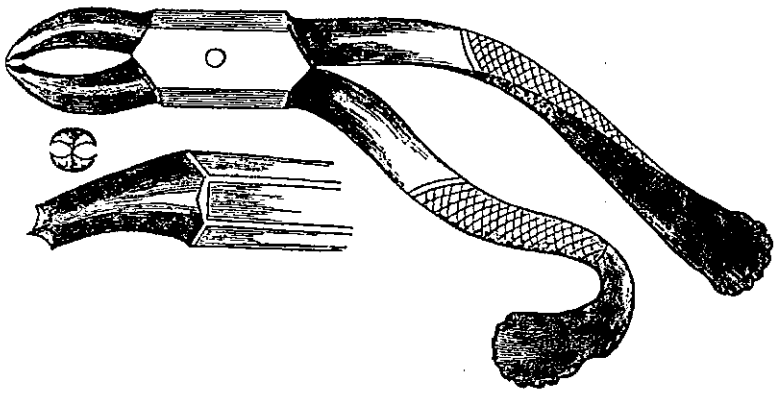
But, in order that the forceps may be used with ease, it is necessary that they should be of a proper shape and construction. Every operator should possess several pair, (seven at least,) each with a differently shaped beak, fitted to the necks of the teeth to which they are respectively designed to be applied.

For the extraction of the molars, the forceps recommended by Mr. Snell, are the best in use. His forceps, for the upper molars, are two in number, one for each side, curved just below the joint, so that the jaws of the beak will form an angle with the handles, of about twenty or twenty-five degrees, just enough to clear the lower teeth. The inner blade is grooved to fit the palatine side of the neck of one of these teeth; the outer blade has two grooves with a point in the centre to fit the depression just below the bifurcation of the two buccal roots.

Each blade of the beak of the lower molar forceps has two grooves, with a point in the centre, so situated, that in grasping the tooth, it comes between the two roots just at the bifurcation. Mr. Snell employs two pair for the extraction of the lower, as well as for the upper molars, in order, as he says, to have a "hook to turn round the little finger," which he supposes must be on opposite sides of the instrument. But this is rendered unnecessary by an improvement made by the author in

the year 1833, which consists in having the handles of the instrument so bent that it may be as readily applied to one side of the mouth as the other, while the operator occupies a position at the right and a little behind the patient. By this improvement, the necessity for two pair is wholly superseded, and it moreover enables the operator to control the head of his patient with his left arm, and the lower jaw with his left hand, rendering the aid of an assistant wholly unnecessary.

Fig. 123.

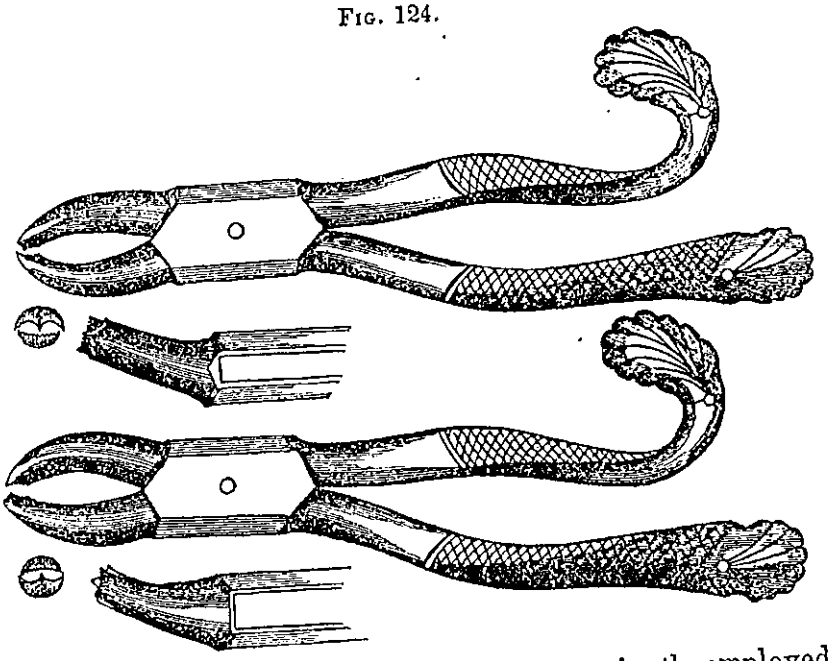


The shape of the instrument, as improved by the author, is exhibited in the accompanying engraving, and all who use it thus improved, and it is now used by hundreds, prefer it to any other instrument they have ever employed for the extraction of the lower molars. When applied to a tooth, the handles, as may be perceived, turn toward the operator, forming an angle with the median line of the mouth, of about twenty-five or thirty degrees. Without this curvature in the handles of the instrument, the arm of the operator would often be thrown so far from his body, as to prevent him from exercising the control over it frequently required in the performance of the operation. And, while it is important that they should be bent in the manner here represented, they should, at the same time, be wide and accurately fitted to the hand.

The improvements made by Mr. Snell in the shape of the beaks of the upper and lower molar forceps, are very valuable, and for which he is entitled to much credit—more than the profession, generally, seem willing to accord. Another, and very

valuable improvement of his consists in having one of the handles bent so as to form a hook. This passes round the little finger of the hand of the operator, to prevent it from slipping. In the drawings which Mr. Snell has given of his superior molar forceps, the hook is on the palatine handle of each, so that in the extraction of a right upper molar, the upper side of the instrument must be grasped, and the lower side in the extraction of a left upper molar. But the author has found that by having the handle so bent, that when applied, the hook of each

Fig. 124.

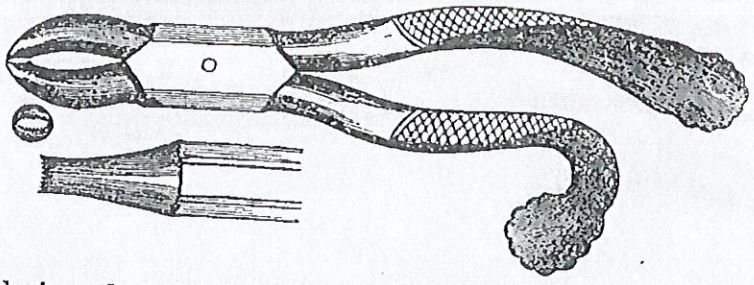


is next the operator, they can be more conveniently employed; and, as in the case of the lower molar forceps, the handles should be wide, and large enough to prevent them from springing under the grasp of his hand; to which, too, they should be accurately fitted. The beak should be bent no more than is absolutely necessary to prevent the handles from coming in contact with the teeth of the lower jaw; for in proportion to the greatness of the curvature, will the force required to be applied to the instrument, be disadvantageously exerted. Every dentist, therefore, in having forceps manufactured, should give special directions with regard to their shape and size. For the extraction of the superior molars, two forceps, as has been

before stated, are necessary; one for the right and one for the left side, as represented in Fig. 124.

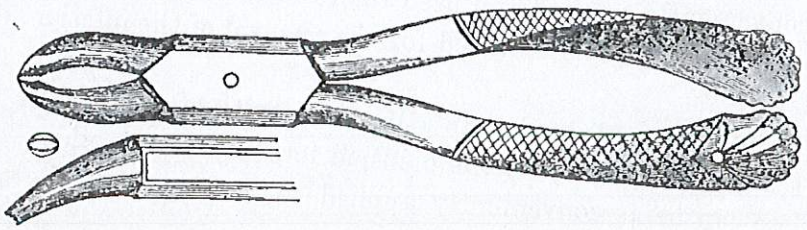
For the extraction of the upper incisors and cuspidati, one pair of forceps only is necessary. These should be straight, with grooved or crescent-shaped jaws, accurately fitted to the necks of the teeth. They should also be thin, so that, when it becomes necessary, from the decay of the tooth, they may be

Fig. 125.



easily introduced under the gum, up to the edge of the alveolus. And, like the superior and inferior molar forceps, the handles should be large enough to prevent them from springing in the hand of the operator, and a hook formed at the end of one of them.

Fig. 126.

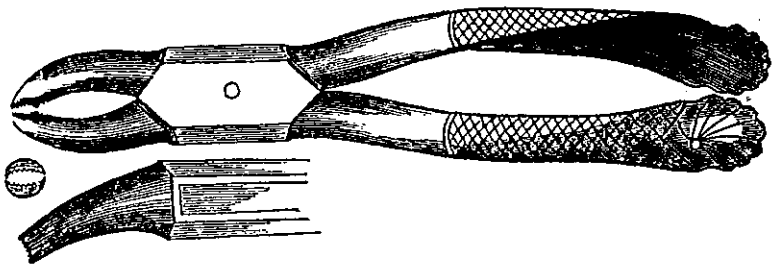


For the extraction of the lower incisors, a pair of very narrow beaked forceps are necessary, in order to prevent interfering with the teeth adjoining the one to be removed. The beak below the joint of the instrument, should be bent downward so as to form an angle of about twenty-five degrees, with the handles, (Fig. 126.) This, too, is one of the most useful instruments that can be employed for the extraction of the roots of teeth.

Forceps for the extraction of the bicuspids should have their jaws so bent as to be easily adapted to these teeth; they should

be narrow, and have a deeper groove on the inside than those for the upper incisors and cuspidati, and like them they should be thin, yet strong enough to sustain the pressure which it may be necessary to apply to them. One pair will answer for the bicuspids of both jaws, but when only one pair is employed,

Fig. 127.



both handles must be straight. The engraving, Fig. 127, represents the instrument here described.

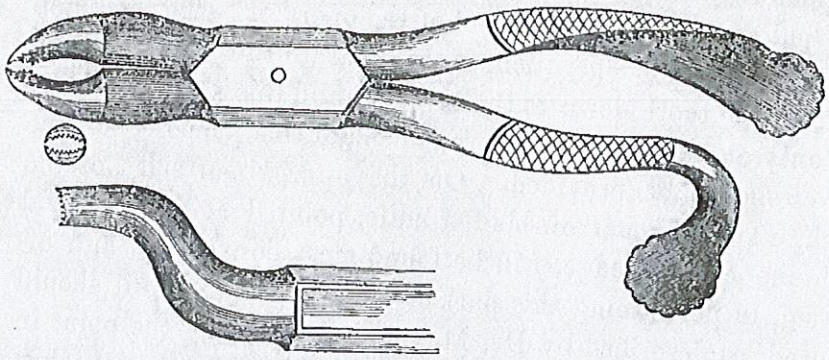
For the removal of the cuspidati of the lower jaw, the hawk's-bill forceps, with crescent-shaped beaks, are often employed, but the instrument last described, and represented in Fig. 127, is better suited to the extraction of these teeth, and can be more conveniently applied and used than the other. No other instrument, therefore, is required for the removal of the inferior cuspidati.

The dentes sapientiæ, also, in a large majority of cases, can be as readily extracted with the bicuspid forceps, as any other, and these can be as conveniently applied to the teeth of the upper as to those of the lower jaw.

But there is another kind of forceps, which can be employed for the removal of the upper dentes sapientiæ, when the bicuspid forceps cannot be applied. The beak of these is bent above the joint, so as to form nearly two right angles, as shown in Fig. 128. These forceps, we believe, were invented by the late Dr. Edward P. Church, about the year 1830, and in those cases where the superior dentes sapientiæ are considerably shorter than the second molars, they can be successfully and advantageously employed, and oftentimes when they cannot be

reached with any other extracting instrument.* These forceps are also useful in the extraction of roots of teeth, situated behind a bicuspid or molar tooth which has a very long crown.

Fig. 128.



A great variety of forceps and other instruments have been invented and used for the extraction of teeth; but the author has not seen any comparable with those which he has just described. Seven pair are all that are really necessary in the performance of the operation; and these, if properly constructed, are better and more efficient than thirty pair of the awkwardly contrived forceps which many practitioners use.

The handles of a pair of forceps should be no longer than is absolutely necessary for the accommodation of the hand of the operator.

In conclusion, he would remark, that Mr. Arnold, Dental and Surgical Instrument Maker, of Baltimore, is in possession of patterns of all the forceps here represented; and that he manufactures them in the neatest and most substantial manner.

*Dr. Church was an ingenious and talented man, and during his brief professional career—a period of about four years, he acquired a reputation for skill, which but few, in so short a time, have ever been able to achieve, and had his life been spared, he would at this time have ranked among the very first practitioners in the country. Born in the western part of the state of New York, he chose the Mississippi Valley as a temporary field for his professional labors, intending ultimately to locate in Cincinnati, but during the prevalence of the Asiatic cholera, in 1832, he fell a victim to this ruthless destroyer, while on a visit to his family, in New York, in the 26th or 27th year of his age.

MANNER OF USING THE KEY INSTRUMENT.

The directions required for the use of the key are few and simple; but, as cases frequently present themselves to which no general rules can be applied, much will depend on the practical judgment and surgical tact of the operator. The first step to be taken in the operation, is, to separate the gum from the neck of the tooth down to the alveolus, and this should be done, not only on two sides, but all round. For this purpose, suitable knives should be provided. On the approximal sides of the tooth, a straight, narrow-bladed knife, pointed at the end, and with one cutting edge, will be found most convenient and effectual, in performing this part of the operation; and it should be used, as described by Dr. Maynard, by passing the point in between the neck of the tooth and gum, down to the alveolus, with its back downwards, and cutting from the direction of the roots towards the coronal extremity of the tooth. In this way, the adhesion of the gum to the approximal sides of the neck of the tooth may be thoroughly severed. The same kind of knife or a common gum-lancet, may be used for separating the gum from the lingual or palatine, and buccal sides of the tooth. If this precaution be neglected, there will be danger of lacerating the gum in the removal of the tooth.

After the tooth has been thus prepared, the key, with the proper hook attached, should be firmly fixed upon it; the bolster, on the inside, resting upon the edge of the alveolus, the extremity of the claw, on the opposite side, pressed down upon the neck. The handle of the instrument should now be grasped with the right hand, and the tooth, by means of a firm, steady rotation of the wrist, raised from its socket. In order to prevent the claw from slipping, (an accident that too frequently occurs,) it should be pressed down with the fore-finger or thumb of the left hand of the operator, until, by the rotation of the instrument, it becomes securely fixed to the tooth.

If the tooth be situated on the left side of the mouth, the position of the operator should be at the right side of the patient; but, if it be on the right side of the mouth, he should stand before him.

For the removal of a tooth, on the left side of the lower jaw, or the right side in the upper, the palm of the hand should be beneath the handle of the instrument; and *vice versa*, in the extraction of one on the right side of the lower-jaw, or on the left side in the upper. The manner of grasping the instrument is, perhaps, of more consequence than many imagine. If it be not properly done, the operator loses, to a great extent, his control over it, and applies the power disadvantageously.

The directions here given, are, in some respects, different from those laid down by other writers; yet, we are convinced, from much experience, that they will be found more conducive to the convenience of the operator and the success of the operation than those usually given for the use of this instrument.

There is a great diversity of opinion, as to whether a tooth should be removed inwards or outwards. Some direct the fulcrum of the instrument to be placed on the outside of the tooth, others on the inside, while others again, regard it as of but little importance on which side it is placed. But experience has taught us that the fulcrum should, generally, be placed on the inside, especially of the lower teeth, as they almost always incline towards the interior of the mouth. Moreover, the alveolar parietes of these teeth are usually a little higher on the exterior edge of the jaw than on the interior; so, that the first motion of the instrument, with its fulcrum on the outside, brings the side of the tooth against its socket, and thus, nearly double the amount of power is required to remove it; while, at the same time, the pain, and the chances of injury to the alveolar processes, are very much increased.

The alveolar walls of the upper teeth are, generally, thinner than those of the lower, and do not afford so strong a support to the fulcrum of the instrument.

It is, however, frequently necessary to place the bolster of the instrument on the outside of the tooth; especially when it is decayed in such a way, as not to afford a sufficiently firm support for the claw of the instrument on this side of the tooth. But, whenever it is possible to remove a tooth inwards, it should be done.

MANNER OF USING THE FORCEPS.

In deseribing the manner of using these instruments, we shall eommenee with the extraetion of the ineisors of the upper jaw. These are generally more easily removed than any of the other teeth.

After separating the gum, in the manner as described in another place, from the neck of the tooth, the latter should be grasped with a pair of straight foreeps, like those represented in Fig. 125, and pressed several times, in quick suceession, outwards and inwards, giving it at the same time, a slight rotary motion, which should be eontinued until it begins to give way; when, by a slight pull downwards, it is easily removed.

If the tooth is mueh decayed, it should be grasped as high up under the gum as possible, and no more pressure applied to the handles of the instrument, than may be neeessary to prevent it from slipping. Teeth are often unneeessarily broken by not attending to this preeaution.

The same direetions will, in most eases, be found applicable for the removal of a lower incisor. But the arrangement of these teeth are sometimes sueh as to render their extraetion rather more difficult. The foreeps best ealculated for the removal of these are represented in Fig. 126.

For the extraetion of a euspidatus, much greater force is usually required, than for the removal of an ineisor. The straight foreeps (see Fig. 125) should be employed for the removal of the superior, and eurved-beaked foreeps (see Fig. 127) for the inferior euspidati. But in the extraction of one of these teeth, less rotary motion should be given to the hand than in the removal of a tooth situated in the front of the mouth. In every other respect, the operation should be eonducted in the same manner. The inferior cuspidati, generally have longer roots, and are, usually, more diffieult to remove than the superior.

Very little rotary motion can be given to a bieuspid, especially an upper, in its extraetion. After it has been pressed outwards and inwards several times, or until it begins to give way, it should be removed by depressing or elevating the hand, as it

may happen to be in the upper or lower jaw; but for the extraction of the upper, the forceps represented in Fig. 125, and for the lower, those represented in Fig. 127, are the proper instruments to be employed in the operation, except the crown has become so much weakened by decay, as to be unable to bear the requisite amount of pressure. In this case, the gum should be separated on each side from the alveolus, about an eighth or three-sixteenths of an inch above its margin, and slitted so as to admit of the application of the narrow-beaked forceps, Fig. 126. With these, the alveolar walls on each side, may be easily cut through, and a sufficiently firm hold obtained upon the root of the tooth, for its removal. These forceps will also be found better adapted for the removal of any of the back teeth or cuspidati, when in a similar condition, than any other instrument.

The upper molars, having three roots, generally require a greater amount of force for their removal than any of the other teeth. They should be grasped as high up as possible, with one of the forceps represented in Fig. 124, and then pressed outwards and inwards, until they become well loosened, when they may be pulled from their sockets. If the forceps used for the extraction of these teeth are of the right description, and properly applied, they will be found the safest and most efficient instruments that can be employed for their removal.

The superior dentes sapientiæ are generally less firmly articulated to the jaw than are the first and second molars, and are, therefore, more easily removed than either of the last mentioned teeth. When their crowns are sufficiently long to admit of being grasped with the bicuspid forceps, (see Fig. 127,) they should be removed with this instrument, but when this cannot be applied without interfering with the anterior teeth, the forceps represented in Fig. 128, should be substituted.

The inferior molars, although they have but two roots, are often very firmly articulated, and require considerable force for their removal, and it sometimes happens, that when the approximal side of one has been destroyed by caries, the adjoining tooth has impinged upon it in such a manner as to consti-

tute a formidable obstacle to its extraction. Two teeth are often removed in attempting to extract one when thus situated, when the precaution of filling the side of the encroaching tooth has not been previously used. This should never be omitted, in the extraction of a lower molar or bicuspid, when locked down in the manner just described. And, though less frequently, it sometimes happens that the upper teeth impinges upon each other in the same manner, and when this occurs, the adjoining tooth should be filed sufficiently to liberate the one that is to be extracted, before attempting its removal. In applying the forceps to an inferior molar, the points on the ends of the blades of the beak of the instrument should be forced down between the roots, and, after having obtained a firm hold, the tooth should be forced outwards and inwards, several times, until its connection with the jaw is partially broken up, and then raised from the socket. If the tooth has decayed off down to its neck, the upper edge of the alveolus may be included between the points of the beak of the instrument, through which they will readily pass on applying pressure to the handles, and in this manner a secure hold will be obtained upon the tooth. The same should also be done in the extraction of a superior molar when in this condition.

The dentes sapientiæ in the lower jaw, when situated far back under the coronoid processes, are oftentimes exceedingly difficult to extract, but with forceps, like those represented in Fig. 126, they may always be grasped, by a little tact on the part of the operator, except in those cases where their crowns have been destroyed by caries, when a portion of the alveoli should be cut away, either with forceps, or a strong sharp-pointed instrument, previously to attempting their removal. It occasionally happens, too, that the roots of these teeth are bent in such a manner as to constitute a considerable obstacle to their removal. But when this is the case, the roots are almost always turned posteriorly towards the coronoid processes, so that after starting the tooth, if the operator is unable to lift it perpendicularly from its socket, he will have reason to suspect its retention to be owing to an obstacle of this nature. To over-

come this, as he raises his hand, he should push the crown of the tooth backwards, so as to make the organ, in its passage from the alveolus, describe the segment of a circle; for should he persist in his efforts to remove it directly upwards, the root will be broken and left in the jaw.

It sometimes happens, too, that the roots of the first and second molars of both jaws, and those of the superior dentes sapientiæ, are bent, or diverge, or converge so much as to render their extraction exceedingly difficult. The convergency of these is often so great, that in their removal the intervening wall of the alveolus is brought away, but neither from this, nor from the removal of a portion of the exterior wall, will any unpleasant consequences ever result. Similar malconformations are occasionally met with in the roots of the bicuspids, the cuspidati, and even the incisor teeth.

Other obstacles sometimes present themselves in the extraction of teeth, which the judgment and tact of the operator alone will enable him to overcome. The nature and peculiarity of each case, will suggest the method of procedure most proper to be pursued in the performance of the operation. The practitioner should never hesitate, whenever it is necessary to enable him to obtain a firm hold upon the tooth, to embrace a portion of the alveolus between the jaws of the forceps. The removal of the upper edge of the socket, is never productive of injury, as it is always, soon after the extraction of the tooth, destroyed by a peculiar operation of the economy. By this means, when the crown of a tooth has become so much weakened by disease as to be unable to bear the pressure of the instrument, it may, in every instance, be immediately removed; and that, too, without inflicting upon the patient, half the amount of pain, that would be caused by attempting to remove it in any other manner. Finally, I would remark, that in every instance, the gum should be completely separated from the neck of the tooth before any attempt is made to extract it.

THE

PRINCIPLES AND PRACTICE

OF

DENTISTRY

INCLUDING

ANATOMY, PHYSIOLOGY, PATHOLOGY, THERAPEUTICS, DENTAL SURGERY AND MECHANISM.

BY

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Thirteenth Edition.

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WITH TWELVE HUNDRED AND FIFTY ILLUSTRATIONS.

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1906.

There are other indications which call for the extraction of teeth, but the foregoing are among the most common; they will be found sufficient in most instances to determine the propriety or impropriety of the operation. Cases are, however, continually presenting themselves to which no fixed rule would be found applicable, and where an experienced judgment alone can determine the practice proper to be pursued.

In conclusion, it is scarcely necessary to say that whenever a tooth can be restored to health it should always be done; but tampering with such as cannot be rendered healthy and useful, and which, by remaining in the mouth, exert a deleterious influence, not only upon

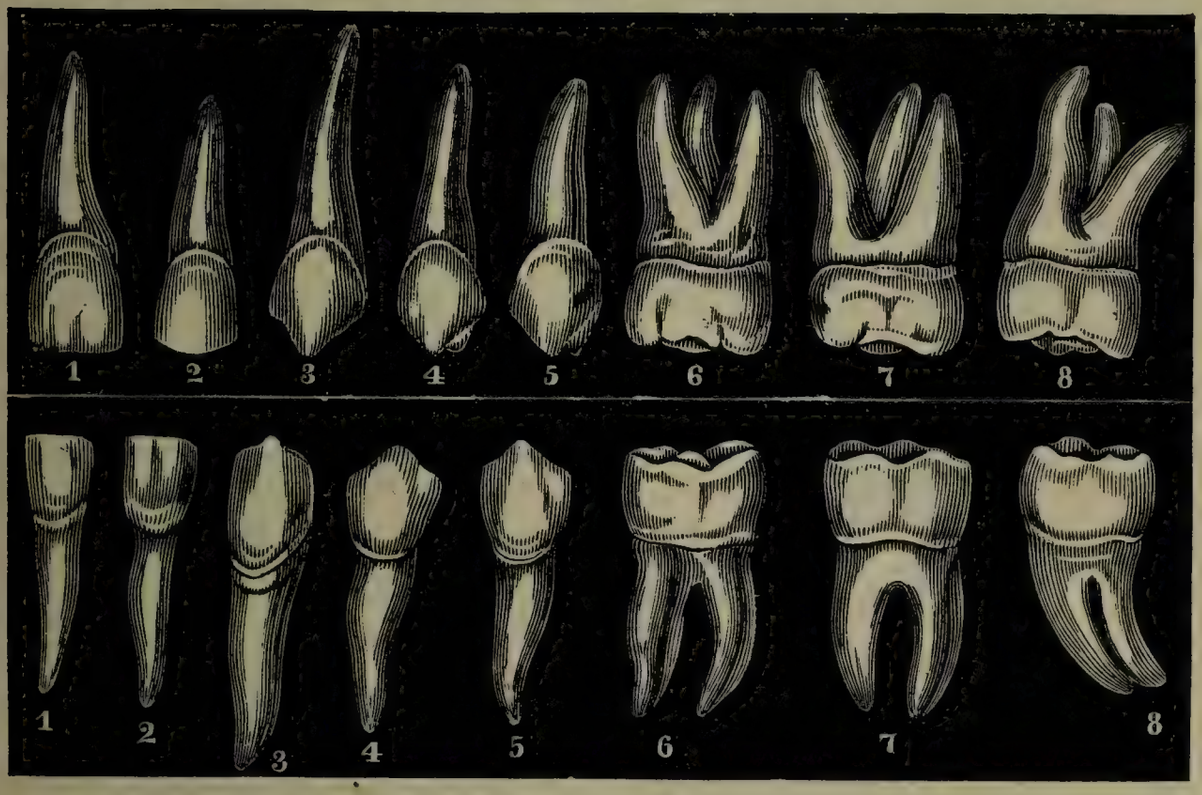


FIG. 520.

the adjacent parts, but also upon the general health, cannot be too strongly deprecated.

Fig. 520 represents the permanent teeth of the left side, a study of which will enable the student to form a correct idea concerning crowns and roots of the different classes of teeth.

INSTRUMENTS EMPLOYED IN THE OPERATION.

Different operators employ different instruments. For about fifty years the key of Garengeot was almost the only instrument used in the performance of the operation; but this has in a great measure been superseded by forceps, which, when properly constructed, are far preferable; yet as the key is still used by some, a brief description of it is here given.

Key Instrument.—"The common tooth-key," says Dr. Arnot, "may be regarded in the light of a wheel and axle, the hand of the operator acting on two spokes of the wheel to move it, while a tooth is fixed to the axle by the claw and is drawn out as the axle turns. The gum and alveolar process of the jaw form the support on which the axle rolls."

Different dentists have their keys differently constructed, but the principle upon which they all act is precisely the same. Some prefer the bent shaft (Fig. 521), others the straight. Some give a decided preference to the round fulcrum, others to the flat; and though the success of the operator depends greatly upon the perfection of the instrument, yet he may remove a tooth more expertly by means of a key with which he is familiar than by one to which he is unaccustomed, though its construction be even better. Fig. 521 represents a key with bent shaft and two hooks, one for molars and the other for bicuspids.

The principle of action of the key is, in fact, not unlike that of a nail drawer or tack puller, and may be adapted to a certain class of

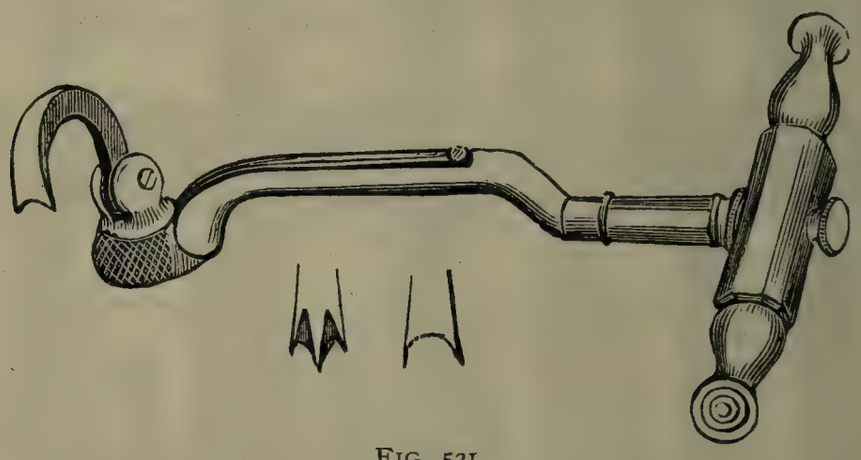


FIG. 521.

cases, namely, where one wall, either the inner or outer, is decayed below the alveolus, while the opposite one is still standing. The fulcrum, with a folded napkin or other soft substance interposed, is placed against the gum on the side of the tooth most decayed and the hook adjusted to the neck of the tooth on the opposite side. With the improved forms of forceps now in use, teeth can be extracted with greater facility, less pain to the patient, and also with less risk of fracture than is possible with the key instrument; hence, the latter is rarely employed at the present time.

Forceps.—Forceps were not very generally or extensively employed, except for the extraction of the front teeth, until about the year 1830; but the improvements made in their construction since that period are so great that their use has now, among dentists, superseded that of the key.*

* To Prof. Chapin A. Harris is due the credit of having devised the first improved set of forceps for the extraction of teeth, of which many of the later inventions are modifications.

In order that forceps may be used with ease, it is necessary they should be properly constructed. Every operator should possess a number of pairs (nine at least), each with a differently shaped beak adapted to the necks of the teeth to which they are respectively designed to be applied.

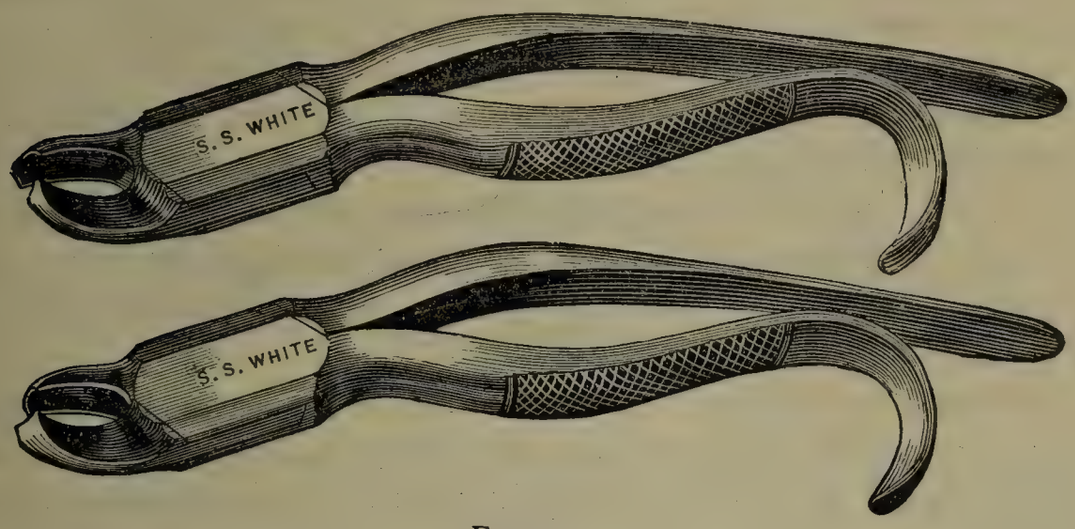


FIG. 522.

For the upper molars two (Fig. 522) are required, one for each side, curved just below the joint, so that the beak shall form an angle of twenty or twenty-five degrees with the handles, just enough to clear the lower teeth. The inner blade is grooved to fit the neck of the palatine root; the outer blade has two grooves, with a point in the

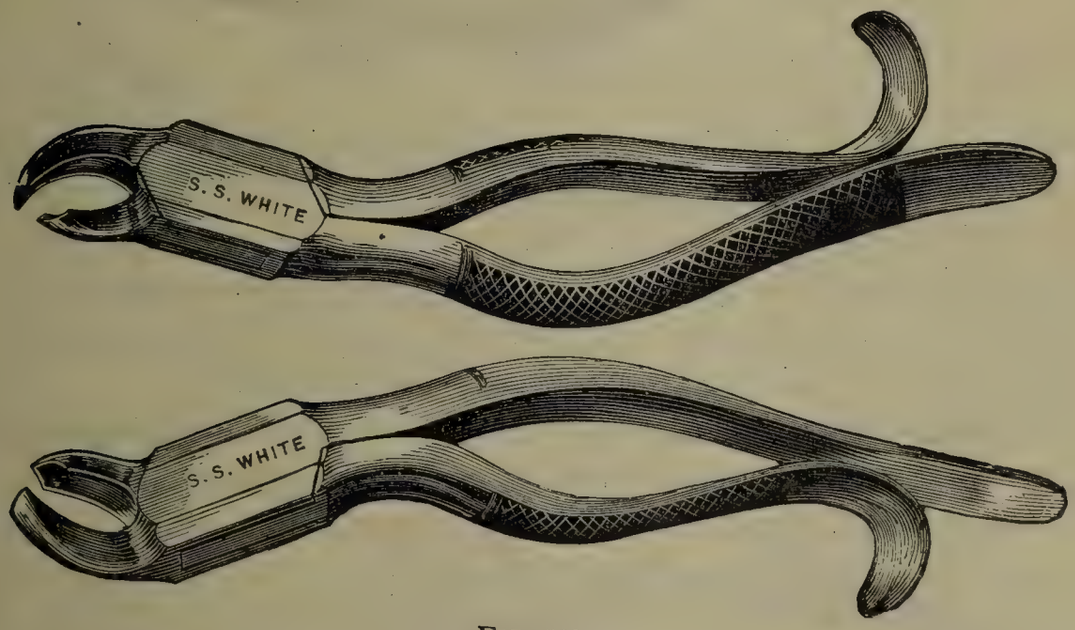


FIG. 523.

center to fit the depressions just below the bifurcation of the two buccal roots. Another valuable improvement consists in having one of the handles bent so as to form a hook. This passes round the operator's little finger, to prevent the hand from slipping.

Fig. 523 represents another form of superior molar forceps, right and

left, with a greater curvature in the handles than the C. A. Harris pattern, which some consider an improvement.

The handles of forceps should be wide and large enough to prevent them from springing under the grasp of the hand, to which they should be accurately fitted, and the ends of the straight handles should be thick and rounded to prevent injury to the palms of the hands. For the comfort of the fingers, the inner corners of the handles should also be rounded. Every dentist, therefore, in having forceps manufactured, should give special directions with regard to their shape and size. The beak should be bent no more than is absolutely necessary to prevent the handles from coming in contact with the teeth of the lower jaw; for in proportion to the degree of curvature will the muscular power of the operator be disadvantageously exerted.

Each blade of the beak of the lower molar forceps has two grooves, with a point in the center so situated that in grasping the tooth it comes between the two roots just at the bifurcation. An improvement made by Prof. C. A. Harris in 1833 consists in having the handles of the

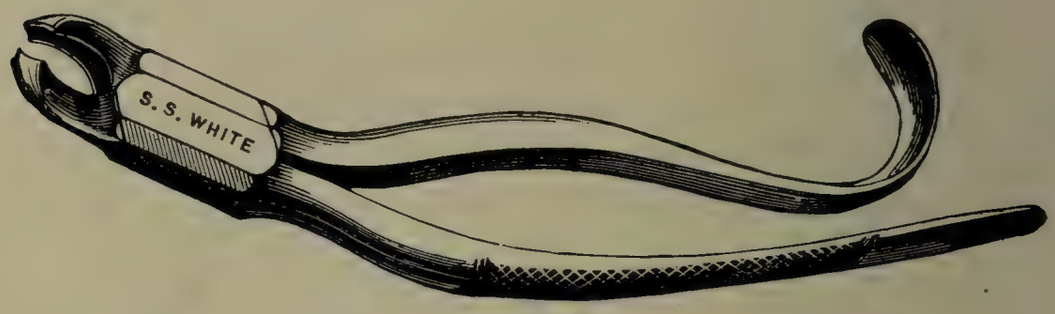


FIG. 524.

instrument so bent that it may be as readily applied to one side of the mouth as the other, while the operator occupies a position to the right and a little behind the patient. By this improvement the necessity for two pairs is superseded; it, moreover, enables him to control the head of the patient with his left arm and the lower jaw with his left hand, rendering the aid of an assistant wholly unnecessary.

The shape of the instrument as improved by the author is shown in Fig. 524. It is now used by many hundreds of operators, who prefer it to any other instrument they have ever employed. When applied to a tooth the handles turn toward the operator at an angle of about twenty-five or thirty degrees. Without this curvature in the handles the arm of the operator would often be thrown so far from his body as to prevent the proper control over the instrument. It is also important that the handles should be wide and accurately fitted to the hand. The inferior dentes sapientiæ can also, in the majority of cases, be removed with this form of forceps.

Fig. 525 represents Wolverton's inferior molar forceps for either

side, with longer points in the center of each blade of the beak, which answer a good purpose where the roots slightly diverge and admit the points within the bifurcation.

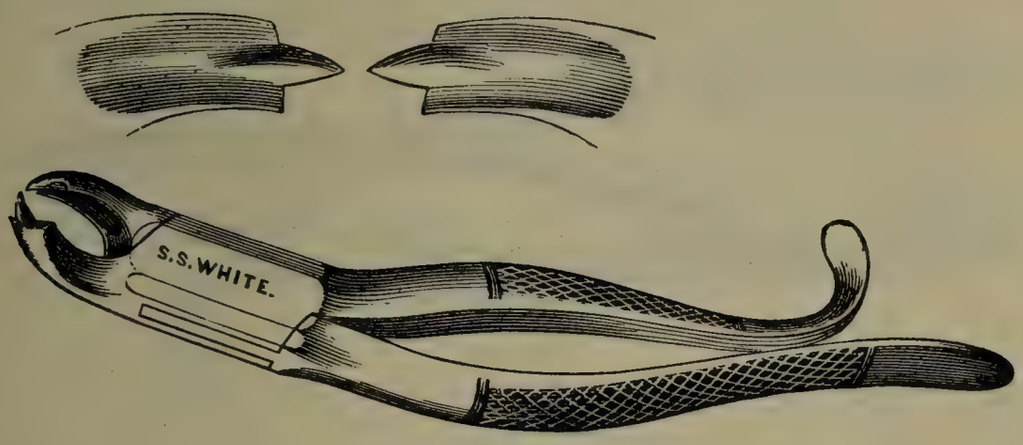


FIG. 525.

Fig. 526 represents inferior molar forceps for the right and left sides of the mouth, which some prefer to the single forceps on account of the position of the hand grasping the instrument.

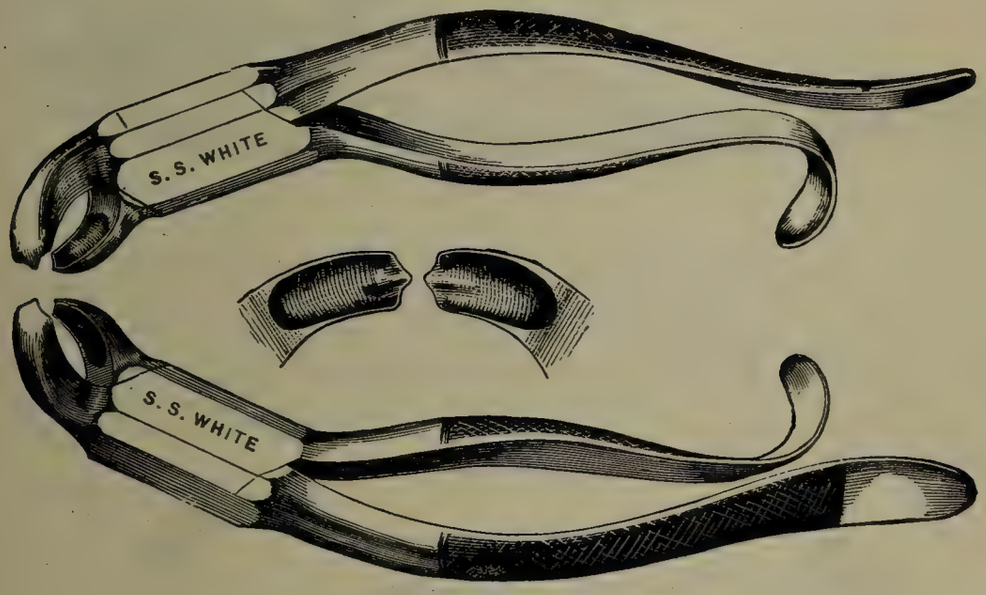


FIG. 526.

Fig. 527 represents a lower molar forceps with plain beaks, for use on either side, intended more especially, however, for the inferior third molars.

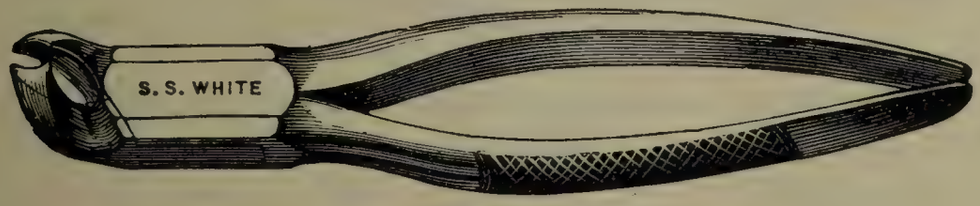


FIG. 527.

For the extraction of the upper incisors and cuspids one pair only may be used, although an instrument with the inner concave beak

somewhat narrower than the outer conforms more nearly to the shape of the necks of the superior cuspids, and is preferred by many for the removal of these teeth (Fig. 528). These should be straight, with grooved or crescent-shaped jaws accurately fitted to the necks of the teeth. The beaks should also be thin, so that they may be easily in-

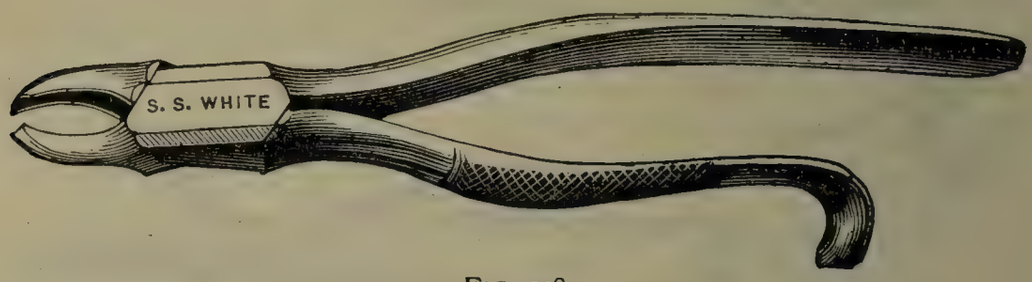


FIG. 528.

troduced under the gum, up to the edge of the alveolus. And, like the superior and inferior molar forceps, the handles should be large enough to prevent them from springing in the hand of the operator, with a hook formed at the end of one of them.

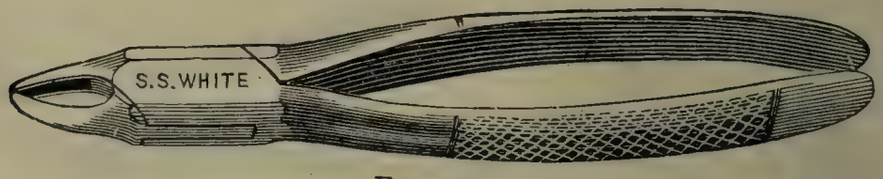


FIG. 529.

Owing to the difference in size between the superior central and lateral incisors, forceps with beaks much narrower than those of the common form of superior incisor forceps are frequently required for the extraction of the latter teeth. Fig. 529 represents an upper lateral incisor forceps with narrow beaks.

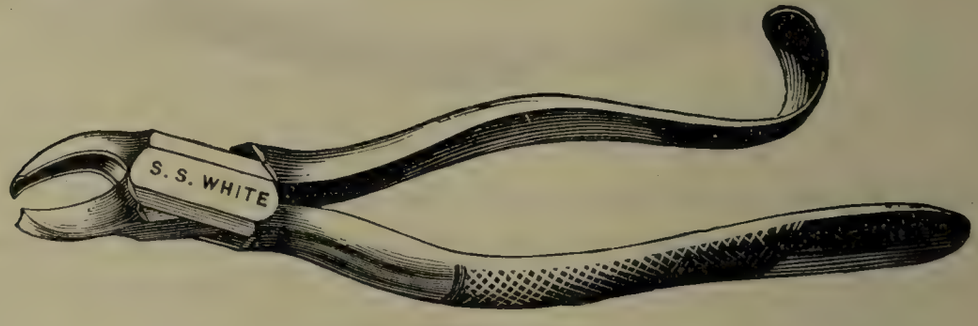


FIG. 530.

Fig. 530 represents another form of a superior cuspid and bicuspid forceps, in which the beaks curve more than those of the incisor forceps.

For the extraction of the lower incisors a pair of very narrow beaked forceps is necessary, to prevent interfering with the teeth adjoining the one to be removed. The beaks below the joint of the

instrument should be bent downward at an angle of about twenty-five degrees with the handles (Fig. 531). This is also a very valuable instrument for the extraction of the roots of teeth.

An instrument similarly shaped, but with the beaks much longer,

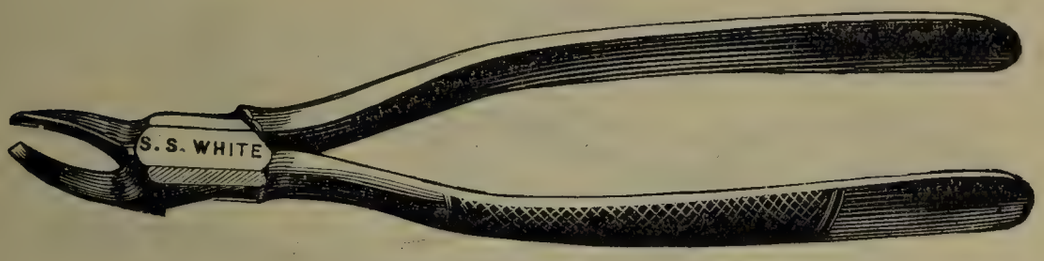


FIG. 531.

makes one of the most universally applicable instruments that can be devised (Fig. 532). The beaks should be made strong, but very narrow.

Fig. 533 represents an inferior incisor hawk-bill forceps, which is

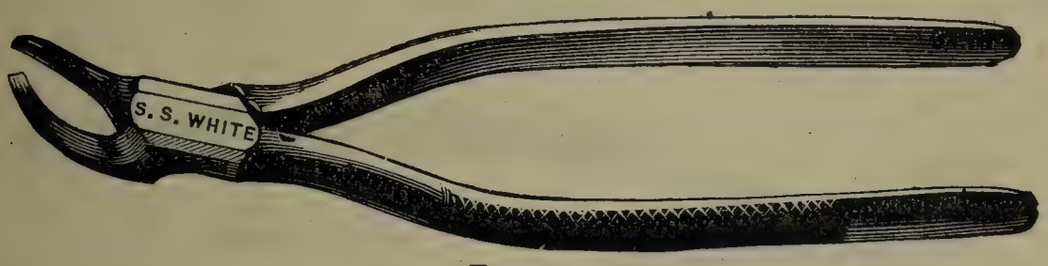


FIG. 532.

a very convenient instrument for the removal of these teeth. It is also used for the removal of the lower cuspids.

Forceps for the extraction of bicuspids should have their jaws so bent as to be easily adapted to these teeth; they should be narrow

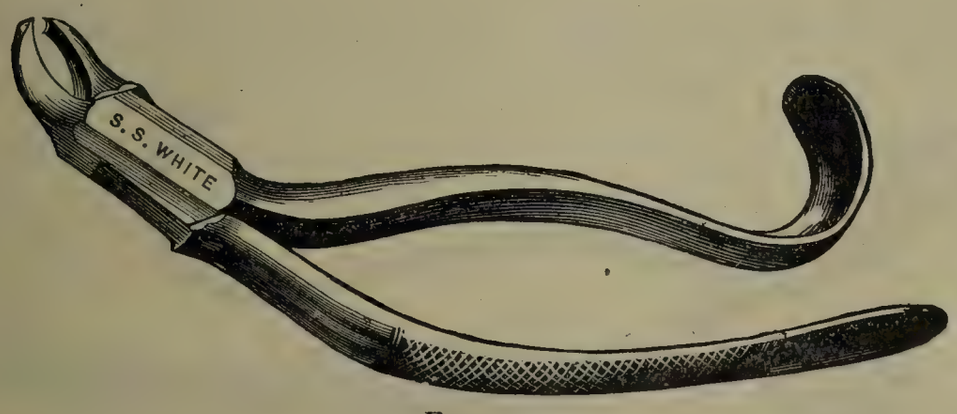


FIG. 533.

and have a deeper groove on the inside than those for the upper incisors and cuspids; like them, they should be thin, yet strong enough to sustain the pressure which it may be necessary to apply. One pair will answer for the right and left bicuspids of the upper jaw (Fig. 534).

For the removal of the cuspids and bicuspids of the lower jaw the hawk's-bill forceps (Fig. 533), with crescent-shaped beaks, is often employed; but the instruments represented in Figs. 535 and 536 are, we think, better suited to the extraction of these teeth, and can be

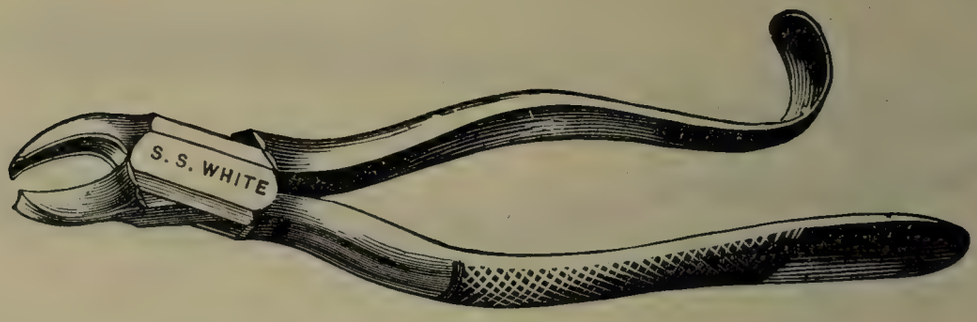


FIG. 534.

more conveniently applied. No separate instrument, therefore, is required for the removal of the inferior cuspids.

The dentes sapientiæ can, in many cases, be extracted with the universal bicuspid forceps, as shown in Fig. 535, which is half curved,

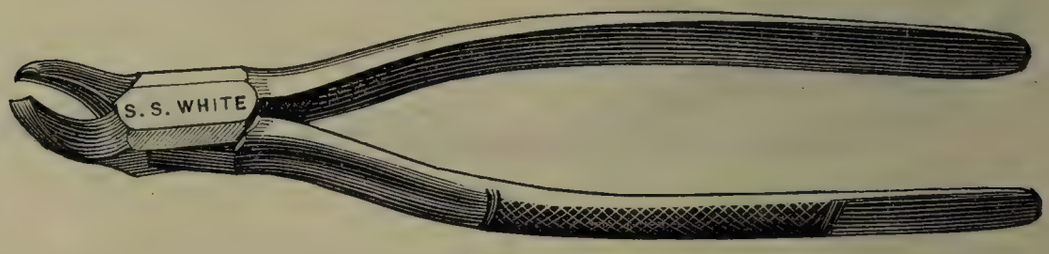


FIG. 535.

with two concave beaks. But there is another kind of forceps which may be more conveniently employed for the removal of the upper wisdom teeth. The beak of these is bent above the joint, forming nearly two right angles, as shown in Fig. 537. These forceps

FIG. 536.

were, we believe, invented by Dr. Edward P. Church about the year 1830, and in those cases where the superior dentes sapientiæ are considerably shorter than the second molars, they can be successfully and advantageously employed; and, indeed, in many cases they

cannot be reached with any of the above-described extracting instruments. The handles of these, as of all other forceps, should be no

FIG. 537.

longer than is absolutely necessary for the accommodation of the hand of the operator.

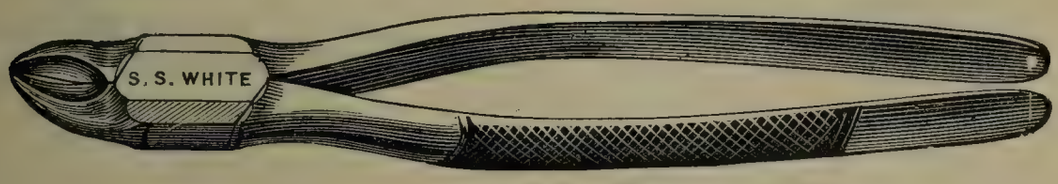


FIG. 538.

For the removal of the inferior dentes sapientiæ, the forceps represented in Fig. 524, Harris's pattern, or the ones represented in Figs.

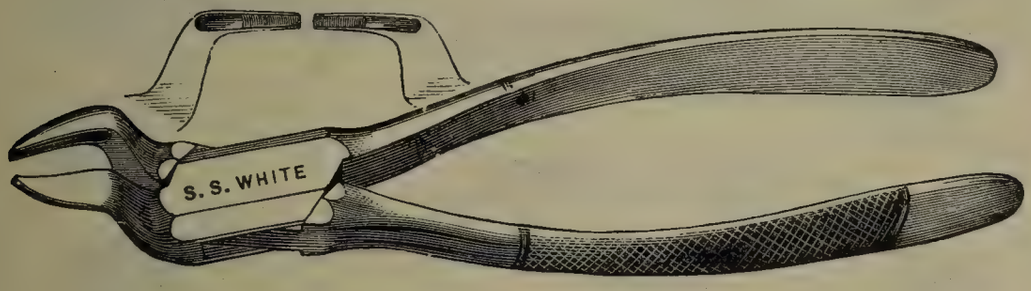


FIG. 539.

526 and 527 may be employed. Fig. 538 represents Physick's dentes sapientiæ for either side, which is used as an elevating forceps.

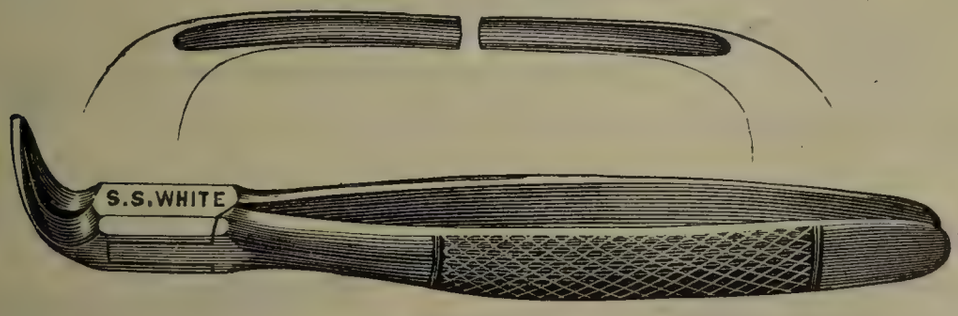


FIG. 540.

For the removal of the roots of the teeth the inferior incisor forceps represented in Figs. 531 and 532 are very useful; also the forms represented in Figs. 539 and 540.

Figs. 541, 542, 543, 544, and 555 represent Parmley's patterns of alveolar forceps for cutting through the alveolar process to the roots of the teeth.

FIG. 541.

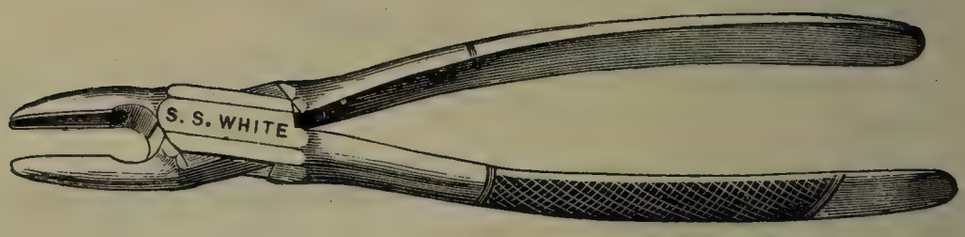


FIG. 542.

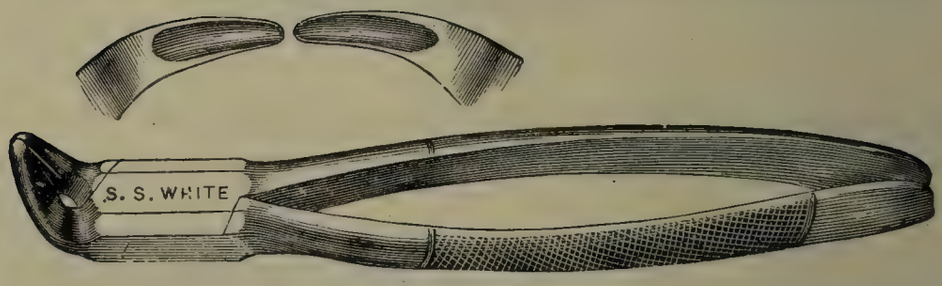


FIG. 543.

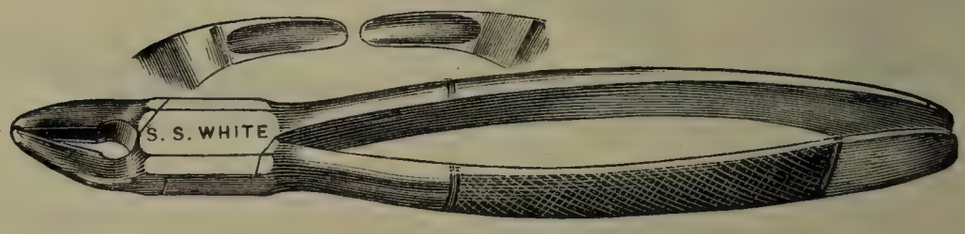


FIG. 544.

The following figures (545, 546, 547, 548, 549, 550, 551, 552, 553, 554) represent a set of ten forceps, called "Common Sense Forceps," which have recently been devised, and which present many useful features worthy of consideration:—

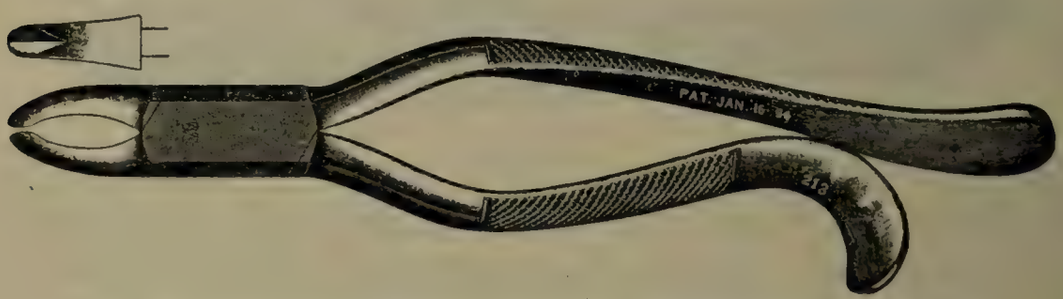


FIG. 545.—FOR UPPER CENTRAL INCISORS AND CUSPIDS, EITHER SIDE.

FIG. 546.—FOR UPPER LATERAL INCISORS, BICUSPIDS, AND ROOTS, EITHER SIDE.

FIG. 547.—FOR RIGHT UPPER MOLARS.

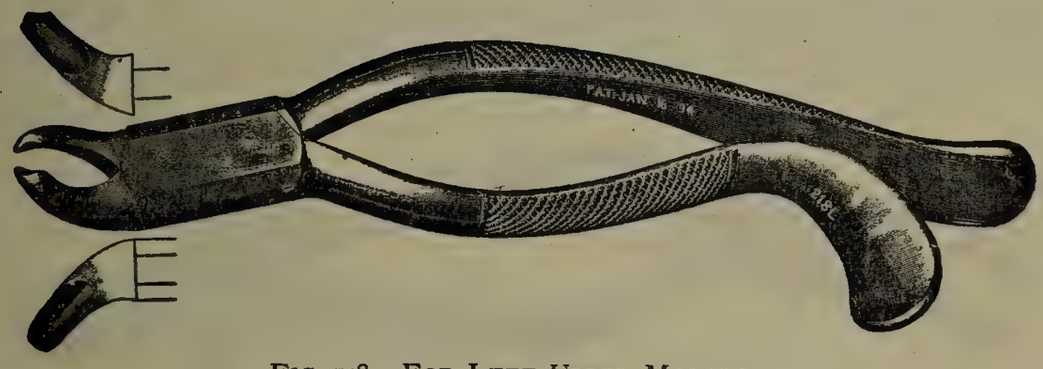


FIG. 548.—FOR LEFT UPPER MOLARS.

FIG. 549.—FOR UPPER THIRD MOLARS, EITHER SIDE.

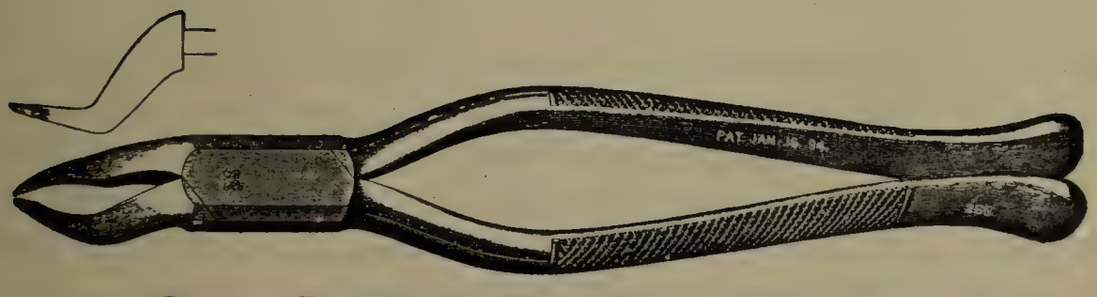


FIG. 550.—FOR UPPER ROOTS AND SPICULÆ, EITHER SIDE.

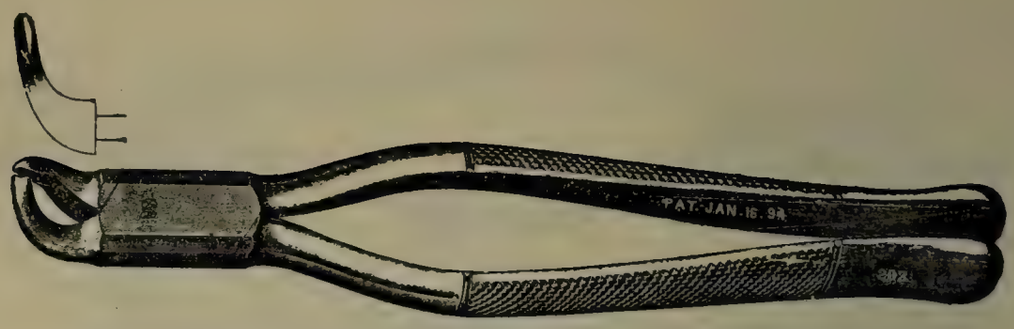


FIG. 551.—FOR LOWER INCISORS AND SINGLE ROOTS, EITHER SIDE.

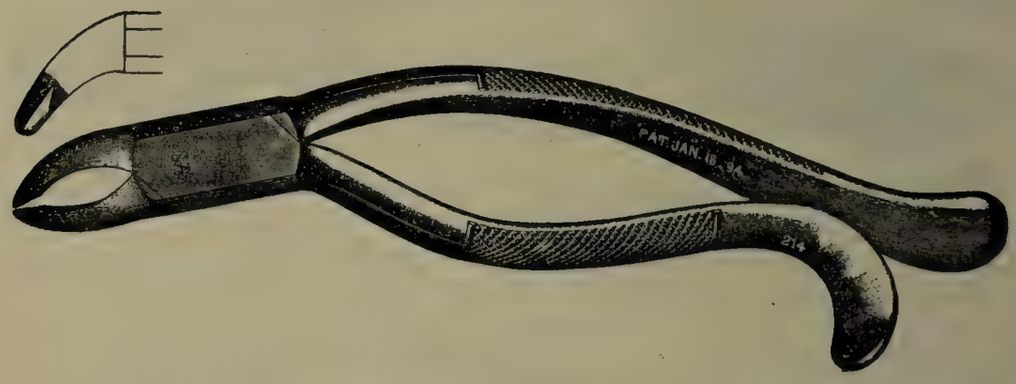


FIG. 552.—FOR LOWER CUSPIDS AND BICUSPIDS, EITHER SIDE.

FIG. 553.—FOR LOWER MOLARS, EITHER SIDE.

FIG. 554.—FOR LOWER THIRD MOLARS, EITHER SIDE.

Dr. W. Storer How writes of the "Common Sense Forceps" as follows: "There is scarcely any instrument used in dentistry that has called forth more ingenuity in devising various shapes than forceps. The object has been to provide a series of instruments of this class which will closely conform to the several classes of teeth, so that they may be removed with the least pain possible to the patient, and

the expenditure of only the necessary force by the operator. As a general rule, ten forceps will answer for a complete set, but for the

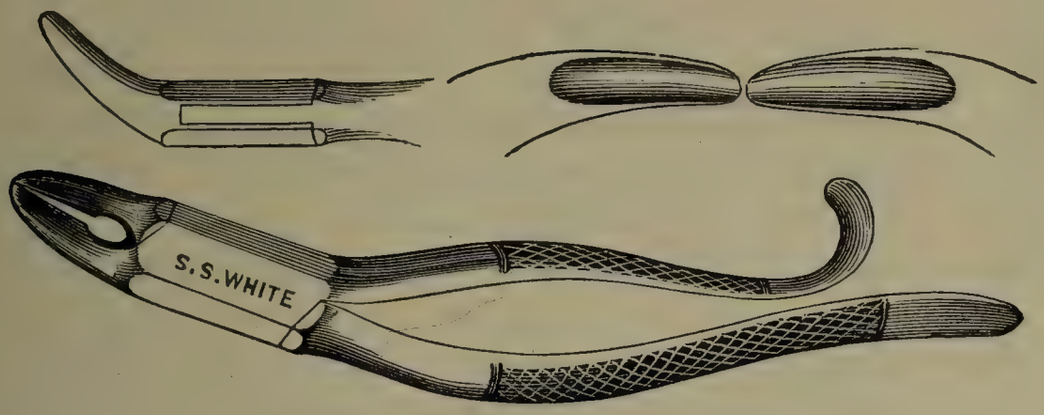


FIG. 555.

requirements of wide ranges of practice, supplemental forms of forceps will be desirable. Skill in the use of a moderate number of these

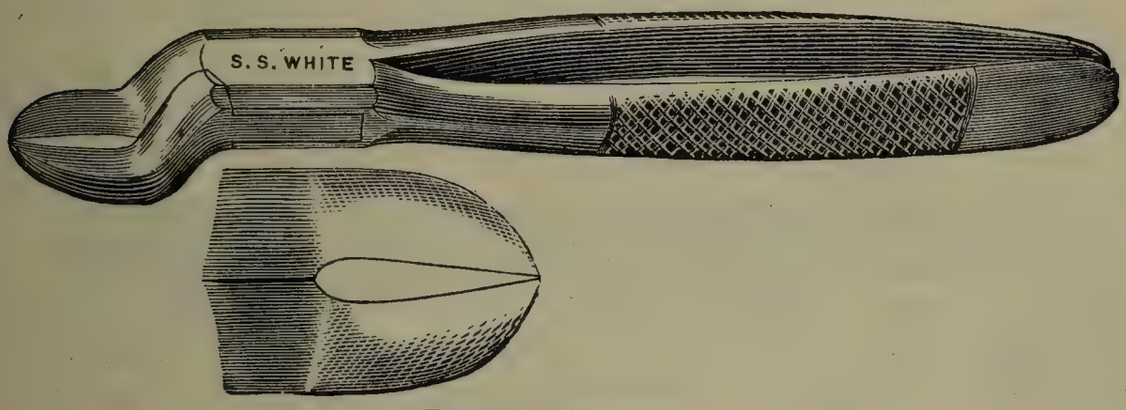


FIG. 556.—SUPERIOR.

instruments is preferable to crowding one's case with an unnecessary number."

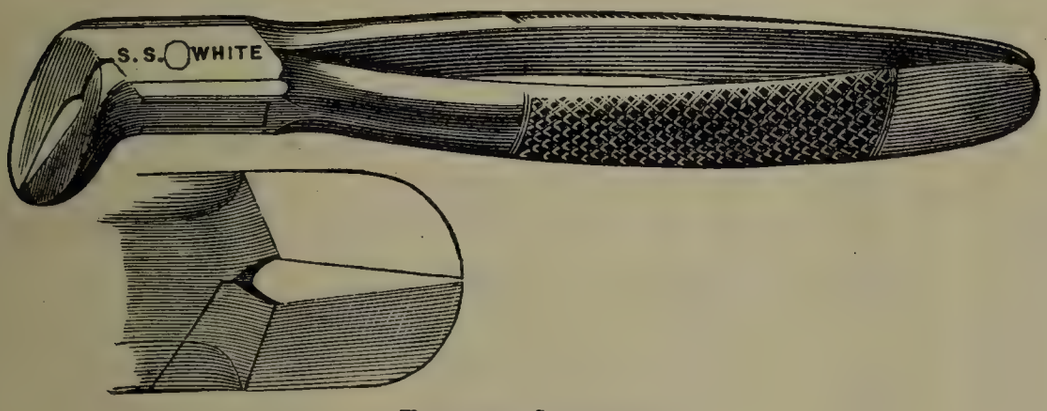
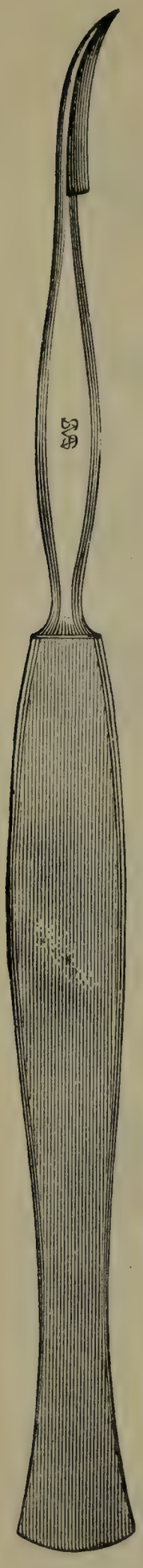


FIG. 557.—INFERIOR.

The form of forceps represented by Fig. 555 is very useful for the extraction of inferior cuspids and bicuspids, both right and left; also for the extraction of roots of inferior teeth.

Figs. 556 and 557 represent Stellwagen's superior and inferior for-



ceps for separating the diverging roots of molar teeth, and which may also be used as elevating forceps.

MANNER OF USING THE FORCEPS.

In describing the manner of using these instruments we shall commence with the extraction of the incisors of the upper jaw. These are generally more easily removed than any of the other teeth.

The use of the gum lancet should generally precede the application of either the forceps or the key. Many dentists object to the operation as unnecessarily inflicting double pain. Some have their forceps made with thin, sharp blades, so as to sever the gum on two sides in the act of pressing up the instrument. This practice may be admissible, perhaps necessary, in certain exceptional cases, as with children or nervous persons, whom the act of lancing might deter from permitting the operation to be completed. But we are fully satisfied that, as a rule, it is very objectionable, either in the use of the key or of the forceps. Owing to the great improvement in the form of the edges of the beaks of the forceps now manufactured, the use of the gum lancet is scarcely necessary, except in the case of teeth that stand alone, where lancing of the gum may prevent the laceration or tearing of the soft tissues, and also in the case of the wisdom teeth and roots of teeth imbedded in the gum.

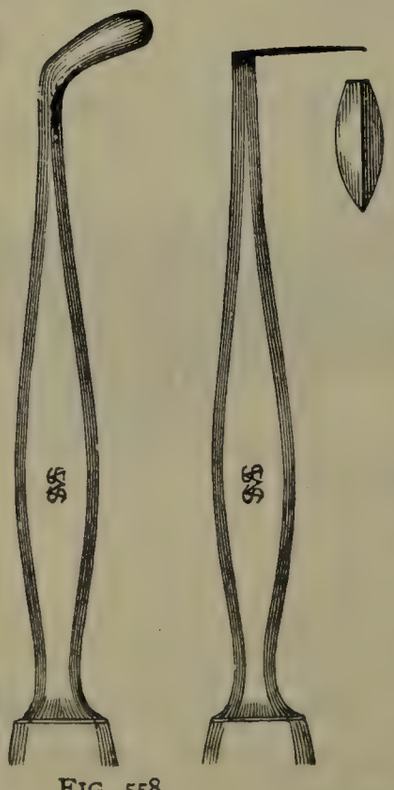


FIG. 558.

Figs. 558 and 559 represent several forms of gum lancets.

Fig. 559 represents a convenient two-blade gum lancet with stop.

After separating the gum, when necessary, from the neck of the tooth, the latter should be grasped with a pair of straight forceps (Fig. 528 or Fig. 530, or, in case the tooth is a lateral incisor, with a narrow crown, Fig. 529), and pressed several times in quick succession outward and inward, giving it at the same time slight rotary motion, which should be continued until it begins to give way; then, by a slight downward pull, it is

easily removed. If the tooth is much decayed, it should be grasped as high up under the gum as possible, and no more pressure applied to the handles of the instrument than may be necessary to prevent it from slipping. Teeth are often unnecessarily broken by not attending to this precaution.

The same directions will, in most cases, be found applicable for the removal of a lower incisor. But the arrangement of these teeth is sometimes such as to render their extraction rather more difficult. The forceps best calculated for their removal are represented in Figs. 531 and 533.

For the extraction of a cuspid more force is usually required than for the removal of an incisor, because of the greater size and length of its root. The straight forceps (see Fig. 528 or Fig. 530) should be employed for the removal of the superior, and the curved-beaked forceps (Figs. 531, 536, and 545) for the inferior cuspids. In the ex-

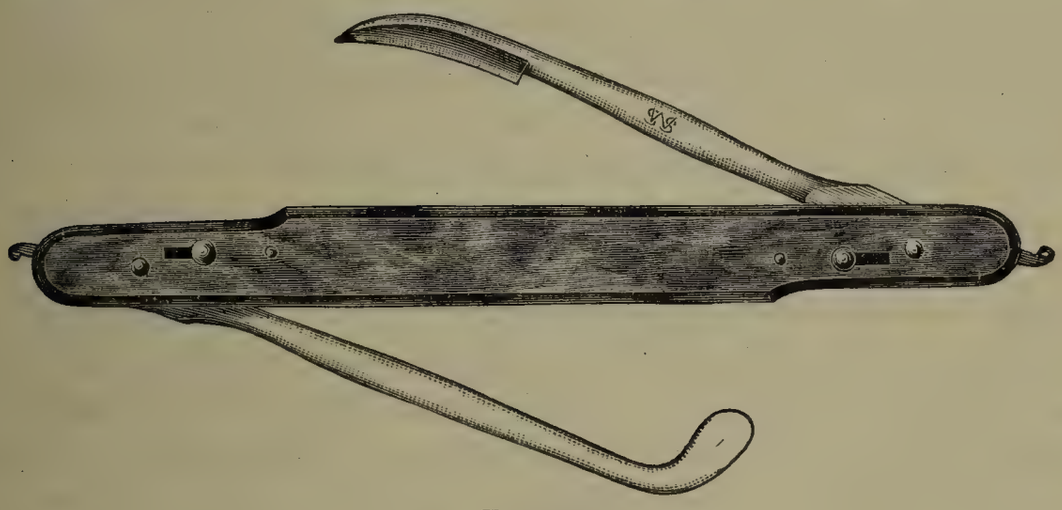


FIG. 559.

traction of these teeth less rotary motion should be given to the hand than in the removal of the incisors; in every other respect the operation is performed in the same manner. The inferior cuspids usually have longer roots, and are more difficult to remove than the superior.

Very little rotary motion can be given to a bicuspid, especially an upper one, in its extraction. After it has been pressed outward and inward several times, or until it begins to give way, it should be removed by pulling in the direct line of its axis. For the extraction of the upper, the forceps represented in Fig. 528 and Fig. 530, and for the lower, those represented in Fig. 536 and Fig. 545 are the proper instruments to be employed, unless the crown has become so much weakened by decay that it will not bear the requisite amount of pressure. In this case the gum on each side should be separated from the alveolus about an eighth or three-sixteenths of an inch, and slitted so as to permit the application of the narrow-beaked forceps, Fig.

531. With these the alveolar wall on each side may be easily cut through, and a sufficiently firm hold obtained upon the root of the tooth for its removal. The forceps represented in Fig. 565 and Fig. 566 will be found better adapted for the removal of the molars, when in a similar condition, than any other instrument.

The upper molars, having three roots, generally require a greater amount of force for their removal than any of the other teeth. They should be grasped as high up as possible, with one of the forceps represented in Fig. 522 or 523, and then pressed outward and inward until the tooth is well loosened, when it may be pulled from the socket. If the forceps used for the extraction of the upper molars are of the right description and properly applied, they will be found the safest and most efficient instruments that can be employed for their removal.

The superior dentes sapientiæ are usually less firmly articulated to the jaw than are the first and second molars; they are therefore more easily removed. When their crowns are sufficiently long to admit of being grasped with the bicuspid forceps (Fig. 535), they may be removed with this instrument; but when this cannot be applied without interfering with the anterior teeth, the forceps represented in Fig. 536 may be substituted.

The inferior molars, although they have but two roots, are often very firmly articulated, and require considerable force for their removal; and it sometimes happens that, when the approximal side of one has been destroyed by caries, the adjoining tooth has impinged upon it in such a manner as to constitute a formidable obstacle to its extraction. Two teeth are often removed in attempting to extract one thus situated, unless the precaution is taken of cutting away the side of the encroaching tooth. This should never be omitted in the extraction of a lower molar or bicuspid locked in the manner just described. It sometimes, though less frequently, happens that the upper teeth impinge upon each other in the same manner; in this case, also, the adjoining tooth should be cut away sufficiently to liberate the one that is to be extracted before attempting its removal. In applying forceps to an inferior molar, the points on the beak of the instrument should be forced down between the roots; after having obtained a firm hold, the tooth should be forced inward and outward several times in quick succession, until its connection with the jaw is partially broken up, and then raised from the socket. If the tooth has decayed down to the neck, the points of the beak may include the upper edge of the alveolus, through which they will readily pass on applying pressure to the handles, and in this manner a secure hold will be obtained upon the tooth. The same should also be done in the extraction of a superior molar in this condition.

The dentes sapientiæ in the lower jaw, when situated far back under the coronoid process, are oftentimes exceedingly difficult to extract; but with forceps like those represented in Figs. 524, 527, or 545, they may always be grasped by an expert operator, except in those cases where their crowns have been destroyed by caries, when the cowhorn forceps represented in Fig. 567 will generally prove useful. It occasionally happens that the roots of these teeth are bent in such a manner as to constitute a considerable obstacle to their removal. But when this is the case, the roots are almost always turned posteriorly toward the coronoid processes; so that after starting the tooth, if the operator is unable to lift it perpendicularly from the socket, he will have reason to suspect its retention to be owing to an obstacle of this nature. To overcome this, as he raises his hand he should push the crown of the tooth backward, making it describe the segment of a circle; for should he persist in his efforts to remove it directly upward, the root will be broken and left in the jaw. Fig. 538 represents an elevating forceps useful in removing the dentes sapientiæ when they are but partially erupted or badly decayed. The points of the beaks of this forceps are inserted between the second molar and partially erupted wisdom tooth, the crown of the second molar being the fulcrum.

It sometimes happens that the roots of the first and second molars of both jaws and those of the superior dentes sapientiæ are bent, or else diverge or converge so much as to render their extraction exceedingly difficult. The convergency of these roots is often so great that, in their removal, the intervening wall of the alveolus is brought away; but neither from this, nor from the removal of a small portion of the exterior wall, will any unpleasant results follow. Similar malformations are occasionally met with in the roots of the bicuspids, the cuspids, and even the incisors.

Other obstacles sometimes present themselves in the extraction of teeth, which the judgment and tact of the operator alone will enable him to overcome. The nature and peculiarity of each case will suggest the method of procedure most proper to be pursued. The dentist should never hesitate to embrace a portion of the alveolus between the jaws of the forceps when necessary to enable him to obtain a firm hold upon the tooth. The removal of the upper edge of the socket is never productive of injury, as it is always subsequently removed, more or less rapidly, by the process of absorption. When the crown of a tooth has become so much weakened by disease that it will not bear the pressure of the instrument, it may be removed in this manner without inflicting upon the patient half the pain that would be caused by the attempt to spare the thin, perishable alveolar walls.

The patient visited my office three times and saw the methods employed in constructing such cases, and, being a dentist, returned to his office, and by the aid of an assistant constructed the entire case himself. The only part I did was to finish the operation by cementing the gold crowns, as before described.

Dr. C. P. Wilson, 85 Newberry Street, Boston, is the dentist referred to, and any one who wishes to see one of the finest pieces of dental work ever constructed should visit him and request him to exhibit it. The front teeth are so well fitted that no one can detect where the joint is without a close examination.

I have had some new spatulas made for mixing cement. I found that the acid would at once attack steel, and as soon as the nickel was worn off a chemical action would at once take place. I now use copper or nickel for spatulas for all cements. I also use a cube of glass instead of a slab. A three-inch cube can be placed in hot water a moment, and sufficient heat will be absorbed, so that all trouble from thermal changes is at once avoided.

(To be continued.)

MECHANICS IN DENTISTRY.—IS DENTISTRY A SCIENCE OR A PROFESSION?[1]

BY W. G. A. BONWILL, D.D.S., PHILADELPHIA.

A VERY unpalatable subject is this I have chosen,—"Mechanics in Dentistry." There is no other word in dental language that is held, to-day, in such disrepute. Every year there is fresh venom hurled against it, or any reference thereto, and it would seem to have fallen from the high eminence which it had in the early days. The good old name has a very strange synonyme,—prosthesis,—which might be well if it were confined to the supply alone of artificial dentures. A moment's reflection, however, will show that when we attempt to divide dentistry into operative and prosthetic or mechanical, we do injustice to our profession, and we assume a false position for our great art, which is founded almost exclusively in our ability as mechanicians, and without which, to a great degree, we would be helpless.

[1] Read before the Odontological Society of Pennsylvania, Saturday, October 8, 1892.

It has become such a disgrace to be known as a mechanic that it is amusing to see, not only dentists, but nearly every man upon the street, or wherever you may go, taking to the English mode of carrying the arms bent at a decided angle at the elbows, and the thumb projecting from the wide-open hand at as great a tangent as possible. You may be curious to know what this means. Well, I am responsible for the version and why originated.

The very act of using the hands to grasp the handle of a hammer, or lift a weight, necessitates the closing of all the fingers and the thumb over them, while the arm is usually, when lifting, nearly in a straight line. These finally give to the individual, when walking, arms that assume a line parallel and vertical with their body, with the hands mostly closed. See the application. A gentleman found with his arms bent at the elbows and thrown as far as possible—gracefully—from contact with the body, his hands with all fingers outstretched and thumb at a right angle with the index finger, will be known as one who never grasped an instrument or extended his arms straight to lift any object. The poor mechanic will be found invariably to take on exactly the opposite. He has never heard of "Hogarth's line of beauty." You may smile at this, but there is too much truth in it. I do not object to graceful positions, but teach the mechanic what it means and let him be an artist.

Students generally feel this tendency of our profession, and it is almost impossible to get them to prosecute this branch of dentistry. Unless they are compelled to learn laboratory work first and thoroughly, they never become efficient in the mechanical department. Once permit them to go to a dental college, where they are allowed the first session to handle delicate instruments over the operating-chair instead of rough tools, the hammer and the "anvil chorus" is no longer heard.

Before we touch upon science, let us ask whether we are a profession? What is its meaning?

The three learned callings are theology, law, and medicine.

The occupation, if not mechanical or agricultural, is placed as a profession. If you can make this of dentistry I am unable to interpret the meaning of our lexicons. The teaching of mathematics does not make it a profession any more than teaching mechanics. We cannot, then, arbitrarily place ourselves before the world as a profession, as now understood; but we are artists, artisans; or we can, more properly, be called scientific artisans.

What is science?

Science is a systematic and orderly arrangement of knowledge.

Facts and truths are the ultimate principles.

Pure science is a knowledge of forms, causes, or laws.

"While both science and art are synonymous, as they investigate truth, science is restricted to the inquiry for knowledge and art for the sake of production."

"The most perfect state of science will be the high and accurate inquiry, and the perfection of art the most apt and efficient system of rules,—art always throwing itself into the form of rules."

What are the sciences which have been so long recognized as seven in number?

Grammar, logic, rhetoric, arithmetic, geometry, astronomy, and music.

You perceive that medicine, law, and theology are not mentioned. They are professions.

You do not find mechanics among the seven. Yet mechanics is made up of geometry and arithmetic, placed together and made efficient and demonstrable by that higher power—God-like in itself—that conceives, designs, and creates, and which is of more importance than any and all of the others.

Boyle says that mechanics, in a larger sense, is for those disciplines that consist of the application of the pure mathematics to produce or modify motion in inferior bodies.

Huxley says, in the *Nineteenth Century*, "Newton defined the laws, rules, or observed order of the phenomena of motion which come under our daily observation with greater precision than had been before attained, and by following out with marvellous power and subtlety the mathematical consequences of these rules he almost created the modern science of pure mechanics."

Newton, in the preface to his "Principia," says, "The ancients made great account of the science of mechanics in the investigation of natural things, and considered mechanics in a twofold respect,—as rational, which proceeds accurately by demonstration, and practical.

"To practical mechanics all the manual arts belong, from which it took its name.

"To describe right lines and circles are problems, but not geometrical ones. The solution of these problems is required of mechanics, and by geometry the use of them, when solved, is shown. Therefore geometry is founded on mechanical practice, and is nothing but that part of universal mechanics which accurately proposes and demonstrates the art of measuring. Rational mechanics will be the science of motions."

He finally says, "I wish we could derive the rest of the phenomena of nature by the same kind of reasoning from mechanical principles."

Thus you see this great master's high estimation of mechanics, and he clearly shows that geometry and mathematics are the two simples that, when combined, give a result that has builded worlds, and without which Newton could not have discovered gravitation, nor could Kepler have formulated his "three laws of motion" which regulate the universe of suns and stars.

Tyndall said of Goethe, in scientific pursuits, that he was so devoid of mechanical principles and the minute details of the powers of construction that he was an ignis-fatuus, and unworthy to be followed.

What gave to the Egyptians the glory that to this day crowns their everlasting works in architecture and their tombs? Mechanics. Their monuments have never been excelled in perfect symmetry and beauty, and their pyramids show no lack of comparison in their calculations in the distance of the sun from the earth with the astronomers of to-day.

Where would they have been in history but for their mechanical productions, that promise to continue for thousands of years? What does the history of all nations have to show of greater interest and more lasting in its results than the mechanism displayed by its peoples? What could Napoleon have said when in Egpyt with his army at the foot of the great pyramids that would have created more enthusiasm than when he most poetically exclaimed, "Forty centuries look down upon you!" What if he had said the work of one hundred thousand poor mechanics, hod-carriers, stonemasons, carpenters, blacksmiths, and artists look down upon you? Go ask the architects of all those wonderful temples on the Nile how they moved those immense granite blocks from the quarry, and how raise them until pile on pile had massed a structure, the mode of doing which the wise mechanics of to-day cannot explain?

Ask the Roman Cæsar what gave him his power in battle? How could those magnificent pieces of masonry have been accomplished but for the skilled mechanics? Coming down to our own times, where is Watt? He lies entombed in Westminster Abbey, by the side of all that is honored in literature, art, science, and war. He was a mechanic!

Sir Christopher Wren. Is his name not upon every lip? What could he have done as a great architect without his inspired mechanical ability?

What has the printing-press done for mankind? It required a mechanic not only to make the type but the press. Is there any monument to the maker of these? Yes. Where is the monument to the dentist?

Morse needs no monument to tell those who may come four thousand years hence of the apparatus invented by him.

Ask Franklin, that universal genius, whether he would wish us to call him a mechanician?

We can ask the *Freemason*. His craft has come down to us through the course of time. No record shows its beginning. We see it to-day in man's memory only as it was in the inception. No tablet has written upon it a word to show its secrets, and yet they are emblazond on everything from the bottom to the highest pinnacle of the Mason's work. "Geometry is Masonry upon a general scale." Who does not consider it a high honor—the highest—to be admitted into its hallowed courts? Who of you that have officiated in its halls and chambers but is impressed at every "step" and every "halt" of the sacredness and importance of the science taught? Labor is engraven upon every panel of the doors that stand guard at "Who comes here?"

Ah, my fellow-members of the dental craft, how much longer will you persist in your ignorance and stupidity? I cannot lose sight of the days in my youth when I once made the jack-plane curl up the shavings to my delight, and how I turned these hands to account in the carpenter-shop, or the cabinet-makers' department, and when I could help to build a house, make a cradle or a coffin, chisel out a gun-stock, or make a blacksmith's or a church-organ bellows; or when there was nothing of this for me to do, I could go into a country store and measure the molasses or the calico. I am glad now of that varied experience.

I am very proud of mechanics when I look around and see men in dentistry who were once poor carpenters, and others engaged in other forms of mechanical trades, attempting to relegate mechanical dentistry to the shades. I feel sure that they never became masters of the art.

For all that is "true" in mechanical dentistry, what, on the other side, is false? We hear of little else at the present time but "science." They attempt to put down every man who has anything to say upon any other subject, and remind him that "if we would elevate our profession" we must take up the subjects of Remedies and Bacteriology. We must no longer fill teeth and resort to the mechanical manipulators.

Professor Miller, of Berlin, in an article read before the Southern Dental Association in 1890, or 1891, spoke of Arthur and Bonwill, who were the advocates of mechanical skill in dentistry, and asserted that it was not scientific to do as they were doing; that the mechanic had no place with the scientific men.

A better example cannot be given than the action of the four honorary American presidents of the International Medical Congress in Berlin, in 1890, Dental Section. The Committee on Essays invited me to read a paper on the Geometrical and Mechanical Laws of Articulation, with the understanding that I was to be there in person. I wrote to two of the honorable body in regard to it, and was advised by them to decline and not be present at the Congress; that I had sufficient honor in having received an invitation. I asked the reasons for such advice. Their argument was that Bonwill was not a scientific man, nothing but a mechanician and inventor, and was working his brain for all he could get out of the profession. A third one, who was interviewed by another party for me, said that they did not wish to have any dentist who could not talk pure science; that at the International Congress in 1880 in London, and at Washington in 1886, the foreign dentists had proven too much for the Americans, and demonstrated their inferior ability in practical scientific work, and that no man would be invited before the Berlin Congress unless he was a good scientific man.

Sir Astley Cooper said that medicine is a science founded on conjecture and improved by murder.

And so bacteriology in dentistry has not yet saved the first human tooth from the ravages of caries, nor has it in the future any bright ray of hope that it will accomplish all that the scientific dentist would have us believe.

If working our brains over such hypothetical problems will make us scientific dentists, while we are permitting the teeth to go to destruction through our present practice, let us hail it; but, at the same time, we would do well not to ignore that true branch of science—mechanics—which has from the inception been the only fixed and certain basis of attacking and battling with caries. We cannot practise the science of dentistry when we attempt to throw overboard its sheet-anchor,—*manual labor*.

So long as we cannot save human teeth by the theory of "germ treatment," but are compelled to labor with our hands, we are doomed to be looked upon as craftsmen and no better than the trades.

The mere experimenter, without any definite results in any

line of work, is not a scientific man. Science is absolute and unchangeable. It is truth! It is an ultimate principle! There is but one result.

I would not have you understand that all experimenting in the secret chambers of nature should be denied. But what I do protest against is, that when scientific men have failed to save human teeth by certain known and acknowledged treatments and practices, they should assume to be the umpires to decide whether the present system, founded almost entirely upon mechanism, should be set aside.

When the teeth become so worn, where germs have had no part in the destruction, what can we look to as our alternative? Bacteriology?

The mechanical dentist is a fixture in our profession, and it would be well to make yourselves competent to be experts in your art, that you can stand in the eyes of the best of society on equal footing with the jeweller, diamond-setter, and cutter. The electrician could not do his work without the steam-engine to drive his dynamo.

The field of mechanical dentistry to-day is unique; and, while we have no system that has been universally adopted, we have done enough to place us as far on the record of progressive dentistry as has the so-called operative department.

While I am no friend to bridge-work as practised, yet it has taught a few men what we so much stand in need of,—manipulative skill.

Crowning has been one of the greatest steps in dentistry so far as pure artificial and mechanical work is concerned; but even this you will find has been most wofully abused by many of our craft, in cutting off the crowns of natural teeth that could have been saved with amalgam for years.

The truly competent dentist who is a born mechanician will seldom have to resort to a crown of any kind. The more we look at the subject will we find that dentistry is a medley, and no man can be competent to practise it who has not been educated in all its departments to do one as well as another.

What is it that will place us among the world's exemplars, and give to us, when dead, a place worthy to be remembered? One man from our ranks has been honored by a public monument, the discoverer of anæsthesia; and if it had been raised while he lived, I am not sure but he would have been abused that he did not give at once his discovery.

The first step to recognition by the public will be when we have, as I have intimated, sought truth for its own sake. Selfishness, envy, jealousy, and ingratitude can have no place in a body of men who labor for the general good. Let us be fair and, when one of our craft has given something original, and it proves a marked advance, place his name, while he lives, on the record. It will be in time a milestone in the records of dental history.

The next most important step is for the live men of our art to visit the great centres of trade and where machinery is developed, and watch the matchless system by which the minutest part is made, and also made interchangeable. Go into the draughtsman's department and scan each line and curve on that chart, where lies in perfect symmetry every portion of the huge engine to be born of that engineer's skill. Go and see it put together, and note whether every bolt and pinion does not fit with absolutely mathematical precision. System, order, conception, design, creation,—without these all would be chaos. Without the laws of geometry and mathematics, with a genius to carry these out and with the perfect system of "interchanging," and machinery adapted for every special piece, they would be as helpless as is the so-called scientific dentist of the day. I never enter a machine-shop of the simplest character that I do not feel a reverence for men who labor and wait for recognition.

We are very far from a system that will enable us to save, with our present means, the teeth that come to us for treatment. The "American System" had no head, and it entailed upon us much that was merely experimental, to fill pages and make volumes.

I think that it was an unfortunate procedure when Dr. was first placed as a title to our names. It is like a big solitaire diamond on the hands of a man who has to labor, whether in dentistry or the trades; he cannot keep his eyes away from it. Nor can he lose sight of the fact that his hand or finger must be placed so that every one else can see it. I appreciated it as much as any one when by certain laws of the colleges a diploma was given me, which I never looked at until the officer demanded it for registration. I would prefer to have on my sign, as on my cards, my simple name.

Professor Samuel Gross said to me, "Do not complete your medical studies at the Jefferson, where you have one course to your credit, for the purpose of being with M.D.'s. Go on in your own way, and do all you can to elevate the systems of practice. Patent what you have a right to, as well as M.D.'s who copyright,

learn to converse with M.D.'s intelligently on most subjects, particularly in dental practice, and I assure you that you will stand as high with us and better than a dentist who could talk medicine from the book, and with no practical experience to show in conversation."

My associates, I will not trespass longer upon your patience and feelings, but remind you that if you will but read over my article, you will find that, although not scientific, it points to the goal where we can see truth. Let us as a society, see what we can get together and place in order to show how far we are standing in the advance, and what its members have done, and place it in the Columbian Exposition, that we can measure, not swords, but the ploughshares we have made which will turn a sod that will, even when harrowed by opposition, give us a pride in our past work; and whether we are recognized as being the peer of any or forgotten, we have the consolation that

> "In doing is reward, and richest he
> Who labors not for time, but for eternity."

OPERATIVE FAILURES AND THEIR REMEDIES.[1]

BY EDWIN C. BLAISDELL, D.M.D., PORTSMOUTH, N. H.

MAN is master over his method; in other words, one will produce a marked success, following a given method, where another will meet with failure, though adopting the same course, but will attain similar success with a method of his own. I am simply stating a few cases, where failures have been noticed in my practice, with perhaps a hint regarding a remedy.

First, we will consider oxyphosphate or oxychloride fillings. I seldom fill a cavity with one of these cements, without the protection of the rubber dam, producing as near as possible perfect dryness of the cavity; yet, whatever cement you use, if the cavity runs to or under the gum, it will not be uncommon for that filling to be a miserable failure, more especially if it is an approximal cavity in bicuspids or molars that are close together. As to the condition of the secretion of the gum, I am not prepared to say. Gutta-percha is not dissolved by the secretions of the mouth, whether alkaline or

[1] Read before the Harvard Odontological Society, September 29, 1892.

Electricity in Tooth Extraction.

A small party of medical men and dentists lately met at the Institute of Medical Electricity, 35 Fitzroy Square, W. C., London, to witness a demonstration of the new method of extracting teeth without pain. One of our staff was there. We sent the one who has most experience in the shocks and squirms of the dentist's chair, and he was imbued when he left the office with more than his share of skepticism regarding the powers of electricity in drawing teeth. He came back brimming full of enthusiasm about the "vibrator." This is what the electrical arrangement is called. It is a simple arrangement, consisting of a neat walnut case, within which are a couple of bichromate cells and a Ruhmkorff's coil to which is attached a commutator of extreme sensitiveness. The commutator is the secret of the whole affair. It is a thin ribbon of highly tempered metal, secured at each end by an elaborate arrangement of screws. It is capable of vibrating at a tremendous pace—so quickly, indeed, that it is really musical—and the force passing through the coil is regulated until the vibrator is in unison with the key A, which the Philharmonic Society says is equal to 420 vibrations per second.

The operator was Mr. Burgoyne Pillin, L.D.S., who stated that he was a visitor himself, not being connected with the institute. He had four patients in waiting. The first was a young professional man, who seated himself in the operating chair to get a bicuspid extracted. He got the handles of the battery in his hands. One of these is connected with the negative pole. The positive is divided into two, so that one of the divisions is connected with the handle and a wire from the other division is screwed into the handle of the tooth forceps. When the patient takes hold of the handles the current is gradually increased in intensity until the patient can bear no more; then, while the forceps are being introduced, the current is turned off for a second, and on again. The rest is the same as without electricity. "Had you no pain?" asked our representative of the patient when the roots of the bicuspid were held up to view. "Not a bit; I only felt the grip." "What did you mean by stretching your body, then?" "Oh, that was when the current was turned on." "You didn't feel the frightful wrench, then?" "No," was the reply. Our representative was still skeptical, it will be seen. All this skepticism went with the next patient, a young and robust-looking lady, who had the left anterior upper molar troubling her. She took the chair, and quickly enough Mr. Pillin had his forceps on the shell. Crack it went, and the usual thing followed—three separate extractions, the last bringing away part of the crown and two twisted roots an inch in length—as bad a case as one could wish to see. It took some time to persuade the patient that her tooth was out. "I felt no pain," she said, after she had an affirmative reply to her question, "Is it out?" The next patient was a young lad who declared that he felt like getting a shave (he had not got his first). His lower bicuspid was also quickly brought to view, and he went out with a smile.

The next turned out to be a bad case. The tooth was fearfully exostosed, and it was only by a prolonged wrench, which was painful to look upon, that Mr. Pillin got it out; but the patient showed not a trace of pain, and he, like the others before him, was quite free from shock. This is one of the characteristics of the process: there is no nervous shock.

The four cases were typical, and all the experts present were enthusiastic about the success, and loud in their praises of Mr. Pillin's skill. Now, why is it that electricity prevents pain? was the question that every one was asking. Simple enough, said Dr. Arthur Harries, the physician to the institute. "Electricity travels over the nerve at the rate of 420 vibrations per second; pain travels from the tooth to the brain in one-sixtieth of a second. My theory is that the electricity, being so much quicker and having the greatest force behind it, gets to the brain first, and then keeps the line for itself, crowding out the pain." If Dr. Harries' theory is right, what a future there is for electricity in surgery! Chloroform and all other anæsthetics will have to take a back seat, and we shall banish pain simply by not allowing it to be produced.

There are other points about the vibrator which we should like to speak of, but need only mention that there is less bleeding and that it interferes in no way with the operator. It is really a good thing, thoroughly sound in principle, and without any humbug about it. —*Chemist and Druggist.*

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WESLEYAN MISSION. SERmons on behalf of the above Missions will (D. V.) be preached to-morrow, 15th inst., as follows: In the Richmond Street Church, at 11 o'clock, a m by the Rev Wm Morley Punshon, M A, President of Conference; and in the evening, at 6:30, by the Rev Wm Butler, D D, of Boston, Mass, formerly Missionary to India. In the Adelaide Street Church, at 11 a m, by the Rev Wm Butler, D D; and in the evening, at 6:30, by the Rev Wm Morley Punshon, M A.

MISSIONARY MEETINGS

Will be held in Adelaide Street Church, on Monday evening, 16th inst, when the chair will be taken at 7 o'clock, by John Macdonald, Esq, General Treasurer of the Society, and addresses by the Rev Wm Morley Punshon, M A, Wm Butler, D D, and Egerton Ryerson, D D, L L D, will be delivered.

In Richmond Street Church, on Tuesday evening 17th inst, when the chair will be taken by W T Aikens, Esq, M D, and addresses by Revs Wm Morley Punshon, M A, Wm Butler, D D, and W J Hunter, will be delivered.

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MEETINGS TO BE HELD.

A GENERAL MEETING OF THE Shareholders of the Rama Timber Transport Company, incorporated by Act of the Ontario Legislature, 31 Vic., chap. 66, will be held on TUESDAY, November 17th, 1868, at 3.30 p.m., at the office of Messrs. Strong, Edgar & Grahame, Jordan Street, Toronto, for the election of Directors and other business.

CONSUMERS' GAS COMPANY.

THE annual meeting of the shareholders of the Consumer's Gas Company of Toronto, to receive the report of the Directors, and for the election of Directors for the ensuing year, will be held at the Company's Office, on Toronto Street, on Monday, the 26th October next, at 7 o'clock, p.m.

H. THOMPSON,
Manager.

Consumers' Gas Company, Toronto, Oct. 2, 1868. 6

GOLD AND SILVER BRONZES and Fancy Coloured Inks, of the best qualities, are made use of by the GLOBE PRINTING COMPANY.

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THE STAPLETON SALT WORKS will ship Salt, suitable for Table or Dairy use, at $1 50 per barrel f.o.b.

This brand obtained the only prize given for salt this year at Hamilton.

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I SHALL REMAIN IN THIS CITY

And carry on as usual the SAME BUSINESS, and will leave NOTHING UNDONE TO IMPROVE

THE QUALITY AND STYLE OF MY GOODS

And by so doing will merit the liberal patronage of my friends and customers as heretofore.

FOR THE COMING HOLIDAYS

I will have A LARGER ASSORTMENT THAN PREVIOUS YEARS.

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ZEBRA COLOURED PRINTING is executed in the most beautiful style by the GLOBE PRINTING COMPANY.

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JOHN RIDDELL,

TAILOR, &C.,

17 KING STREET WEST.

J. R. has now in stock a general assortment of Cloths, Tweeds, &c, &c, suitable for the season.

Also, Underclothing, Shirts, Collars, Ties, Scarfs, gloves, socks, &c, &c, quite new and good qualities.

APPEAL CASES, CORRECTLY, neatly and cheaply printed by the GLOBE PRINTING COMPANY.

ESTATE NOTICES.

WILL YOU USE BAD AND dirty Cards, Circulars, &c., when the best are to be obtained from the GLOBE PRINTING COMPANY.

ESTATE OF JAMES BEACHELL.

ALL PARTIES having claims of any nature or kind against the estate of **James Beachell**, late of the City of Toronto, Esquire, deceased, who died on or about the 17th day of May, A.D., 1867, are required to furnish particulars of the same, properly attested to; and all persons indebted to the said Estate are required to make payments to

RICHARD BEACHELL,
Administrator.

Or to his agent,
J. W. G. WHITNEY,
British America Insurance Buildings.
CAMERON & HARMAN,
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SEWING MACHINES.

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105 King street west, Toronto, and 37 Spark street, Ottawa, General Agent for Ontario.

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CORDWOOD, AT $4 50 A CORD, DELIVERED, at

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☞ Cut and split for 90 cents extra.

P. S.—A lot of about 60 cords of Hemlock for sale CHEAP.

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