ing all the notes of the scale, from the highest to the lowest, in pure tones free from harmonics and capable of giving these notes in intensities readily measurable and varying from a point below the threshold of excitation of the most sensitive hearing up to a degree necessary to awake sensation in persons suffering from the most profound deafness.

Moreover, in order that such an apparatus may deserve universal acceptance, it must be possible to construct as many others as are wanted of the same type, each constant for itself and precisely similar to the others. It is only then that we can hope to make it available for a uniform notation comparable among different observers.

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TONSILLECTOMY BY THE SLUDER METHOD

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It is a matter of pride to us that, though total removal of tonsils has been advocated and occasionally practiced for decades, laryngologists within the last dozen years have established enucleation in capsule as the operation of choice and clearly defined the indications for it. As a result of their effort, with its leadership in America, general practitioners and laymen alike are fast coming to demand this procedure. Quick to appreciate its value, they are equally alert to detect faulty work and ready to condemn its author.

We will all admit that enucleation is being well done by sharp or blunt dissection, by the aid of scissors or knives and forceps of various designs, in most of which combinations the snare figures prominently, and that the performance of tonsillectomy will by any method demand much study and practice. On the other hand, we must concede that there is much bungling work being done to discredit legitimate tonsil surgery and that the question of how tonsils can best be removed is still an open one.

It is opportune, therefore, to emphasize the value of an operation with which you are all more or less familiar, but which, in spite of its merits, has not yet received the recognition that is bound, I believe, to place it foremost of all methods for tonsil removal.

The large percentage of unsatisfactory results following the operation on the tonsils by use of the guillotine has done much to bring discredit on this operation. When, therefore, Dr. Sluder advocated the use of this instrument, modified in certain particulars, for the operation of tonsillectomy, most of the men doing this work were not prepared to accept offhand his statement regarding the effectiveness of his operation.

The clear descriptions of the Sluder technic make it unnecessary to dwell on it here. The essence of this new idea is that the tonsil, when scooped up by the ringed margin of a fenestra in one end of a stout shaft, introduced below and behind the gland, pressing it upward and forward and outward toward the rigid alveolar eminence of the jaw, can be put entirely through this opening, especially if counter-pressure is made on the tonsil with the finger inserted in the mouth and applied to the outside of the palatoglossus. When thus put through the fenestra the gland can be quickly separated from its attachments outside the capsule by guillotine, pushed as with Dr. Sluder's instrument and

its modifications, or pulled as with the ring guillotine suggested recently by Dr. Jennings of St. Louis, or with Dr. Beck's snare or those of others, or severed by scissors or knife. One may do this operation by utilizing the ring in the handle of a strong pair of forceps and a snare.

In view of the simplicity of this method it seems strange that the guillotine was not used for tonsillectomy long ago.

I would emphasize several points of technic. First, it is essential to keep the shaft of the guillotine oblique across the buccopharyngeal cavity, with the ringed end pressed with sufficient force well below the lower extremity of the tonsil to insure the presence of the entire gland in front of the ring as it is brought upward and forward. Secondly, the importance of pushing the last vestige of the gland through the fenestra by judicious massage with the fingers is fundamental. To make sure of complete dissection—this is the key. Thirdly, the blade should not be too sharp, lest it unduly buttonhole the capsule and slice the tonsil itself. A sharp blade may be effectually blunted by taking off its edge with any metal object, care being taken that

A. M. Corwin's Improved Sluder-Ballenger guillotine.

the knife margin accurately fits the ring against which it is to be thrust. Neither should the blade be too dull, since it requires undue leverage to force it home, and it does not dissect so well. The matter of hemorrhage, as between the use of sharp or blunt dissection, is, in our experience, negligible, bleeding in any event being controlled according to indications. Fourthly, after final pressure on the blade, the lingering attachments of mucous membrane and fibrous shreds should be severed with the finger so that the guillotine comes away easily without dragging on the tissues; and it always holds the removed tonsil in its grip, necessitating no use of forceps.

As an adjunct of this method, which has become an essential part of my technic for two years, I wish to commend the routine use of a pair of tonsil hemostats, of which there are several forms on the market. This one of my own design is simple, quickly adjustable and when in place is out of the way. The patient being asleep on his back, as soon as the first gland is removed, which takes but a few seconds, one of the hemostats is applied, immediately reducing bleeding to a minimum and allowing the removal of the opposite tonsil without

delay in a pharynx relatively bloodless. Twenty-five per cent. tincture of iron in glycerol (glycerin) has been used on the pad, and this alliance of styptic and pressure has reduced the total loss of blood in my cases to a very small amount. In more than fifteen hundred tonsillectomies none have demanded attention from secondary hemorrhage, which is more than I can say for my previous work.

Incidentally, I find most satisfaction in anesthetizing all patients, young and old, with gas and oxygen in the hands of an expert, rather than with ether, chloroform and ethyl chlorid; in this regard I have been fortunate, and shall never again use any of the latter if the former can be had. This gives a greatly shortened period necessary for total manipulation, four minutes usually covering the whole procedure from the time the patient is wheeled into the operating-room until he is wheeled out on his way to bed. If needed, however, this anesthesia may be extended as long as desired.

The added security appeals to the laity as well as the surgeon. The value of the oxygen safety-valve is beyond question, and is a source of critical comfort to the operator in handling those occasional patients who do not take any anesthetic well. The relative absence of nausea and prostration after operation also commends this combination.

It is my mature judgment, based on large experience, that the Sluder method is applicable to all cases except those rare ones in which incomplete or mutilating measures or inflammatory processes have left the parts bound in a network of rigid, unyielding scars with little tonsil tissue present. Here judgment will advise the use of knife or cautery. Ordinary stumps and buried glands surrounded by adhesions, whether large or small, are easy victims to a skilful use of the method in question.

It has been asserted that no purely mechanical device can perform this dissection. This hypothetic objection is disproved by the experience of many who have done the Sluder operation extensively and are its ardent advocates.

A second objection, by Dr. Otto Freer, assumes that "to squash chronically septic tonsils through a powerful ring will necessarily force germs into the lymph-channels, especially if a concealed chronic peritonsillar abscess exists." He adds, however, that "considering the great amount of blunt tonsil enucleation being done, serious consequences are surprisingly rare, but are sure to be encountered in a large series." This is purely fanciful. Ample observation does not justify it. Such a dire effect has never occurred in my own extensive experience, nor has it been reported, so far as I know, by any of the dozens of expert operators who have used this measure. How unlikely such an occurrence is, even from a speculative point of view, follows from the fact that the capsule and inflammatory wall of a concealed chronic abscess are firm fibrous barriers, much more impenetrable than the tonsil itself, so that actually when the structures are pressed on from the outside, behind the anterior pillar, the adventitious contents of the organ tend to escape in the line of least resistance through the crypts into the faucial cavity. This is what takes place, the tonsil often being literally turned inside out.

Brains and experience are as much factors in the successful performance of the Sluder method as in any method. The size of the fenestra is important in this

connection—the larger the tonsil, the more flabby or long in its vertical measurement, especially in adults, the more the advisability of employing the guillotine with the largest opening, which wholly eliminates even the imaginary danger of undue mechanical violence referred to.

Dr. Freer again has publicly called attention to the value of preserving the plica triangularis with which to line the muscular cavity from which the tonsil has been dissected. This structure, as convincingly pointed out by Dr. G. Fetterolf,¹ is a part of the tonsillar capsule. There seems no more reason for preserving it than for preserving the rest of the capsule, which to-day we aim to remove. Operative results of its removal sustain the wisdom of it. How many, in truth, operating by ordinary dissection, are preserving this plica and carefully stitching it to the surface of the pillars and superior constrictor in order to give this surface a covering of epithelium? Unless it is so held in place, how much good would it do to leave it?

Finally, much has been said about the cutting or tearing of the anterior pillar and dragging away of muscle fibers. I have here about a quart of miscellaneous tonsils for your inspection. If you find clinging to them an essential part of structures that should have been preserved, I should like to have this pointed out. I am only sorry that I have not the corresponding throats here from which they were taken in order to show the clean and perfect results that were attained clinically.

The Sluder guillotine has been dubbed by Dr. Freer a device of fear and incompetence to be used by those who cannot do scientific surgical dissection. Says the critic: "Those advocating such mechanisms always have in mind a typical tonsil for which the implement is constructed, and ignore the many changes produced in the tonsil and its surroundings by pathologic conditions, which make the operation of tonsillectomy one requiring great versatility." The attack, however, assumes that little judgment, skill or knowledge of anatomy is needed to apply the principles of the operation laid down by its discoverer. The facts are that many who are skilled in the employment of knife or scissors and snare have laid these by for this up-to-date guillotine as a better measure.

With scant courtesy toward its author, some have suggested that the instrument should be called the Mackenzie-Sluder, as if to hyphenate both names and honor, forgetting that no originality is claimed by Dr. Sluder for the guillotine idea, but rather for a totally new use of a very old device. By inference, no surgeon employing a scalpel should be entitled to fix his name unqualifiedly to any new operation, because, forsooth, the knife was first used by Sir Daggers Flint, of the stone age.

It would not be surprising if the Sluder method were a failure in the hands of any one who relies for its performance on the cheap, grotesque imitations of Sluder's guillotine which are now on sale by certain instrument houses. There is no excuse for these misrepresentations in metal when the original was so carefully described by its author. There ought to be some method of rigid standardization among manufacturers of instruments marketed under definite titles.

15 East Washington Street.

1. Fetterolf, G.: *Anatomy and Relations of the Tonsil in the Hardened Body*, Am. Jour. Med. Sc., 1912, cxliv, No. 1.