

ought to be kept in view. I do not see so much resemblance between melancholia and neurasthenia as between incipient paresis and neurasthenia.

DR. DANIEL R. BROWER, closing—The hot-air baths and the hot pack meet the very important indication of elimination by the skin, and are both sedative to the nervous system. The hot pack should be given on a lounge close to the bed, so that the patient may be placed in the bed without exposure.

As to electricity, one of the mysteries of the times is the fact that we have so many in the profession who fail to realize the curative power of electricity per se, and refer its effects to suggestion alone. Yet these same persons must recognize its great economic power; the electric light, the telephone and the automobile must constantly force this upon them, and then they must recognize its power to decompose water, and destroy tissue. Even regarding it as a purely suggestive agent, I ask those who decri its use, what more convenient agent of this sort can you find? But I beg of them to consider carefully the physiological action of the several forms, in use, before they begin their suggestive treatments.

## INTUBATION IN PRIVATE PRACTICE, AND ITS PERFECTION.\*

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You probably know that intubation was formerly received in Europe with great reserve, and also that the ingenious operation of O'Dwyer is practiced at the present time only by our clinicians. The reason why our practitioners have not much inclination for the endolaryngeal method is, that, being so conservative, they in this case apprehend that intubation is an operation immensely difficult to learn, and accompanied by a great number of dangers.

One who is experienced in the matter knows that these apprehensions are exaggerated, that intubation is not at all more dangerous than tracheotomy, and that its sphere ought not to be limited to the hospital. But prejudices of that kind, if they once exist, will not be removed by the reports of single persons, however splendid they might be, but only by extensive, thoroughly authenticated statistics.

In the summer of 1899 I took the trouble to procure data concerning intubation, and I believe with best success. I applied to 89 American and European authors, and that as well to friends as to opponents of intubation. What I learned was:

	Have done, Physicians.	Intubations.	Recoveries before 1894. Per cent.	Under Serum- therapy. Per cent.
In Germany . . . .	12	56		66
In France . . . . .	8	437	30	77.11
In Galicia . . . . .	5	165	30	89.9
In Italy . . . . .	4	265	22.5	76.9
In Norway . . . . .				
In Austria . . . . .	6	74	43	95
In Russia . . . . .	1	4		100
In Switzerland . . .	3	18	42.08	100
In Spain . . . . .	1	322		77.7
In Hungary . . . . .	2	63	61	60
In Europe . . . . .	42	1404	39.50	82.58
In U. S. A. . . . .	13	4066	31.5	81.5
Total . . . . .	55	5470	35.54	82.04

These fifty-five reporters think intubation in private practice just as useful as in clinical service; twenty authors had no personal experience in the matter. The rest remained in decided opposition. It may be noticed that the latter ones together disposed of but seventy-three cases, seven of them never proved the effect of

the operation in private practice. The common reason given for opposition was that the dangers of the after-treatment would be greater in practice; that therefore it would be necessary to keep the children under continued medical surveillance and that this very surveillance would be, under ordinary circumstances in practice, a matter of impossibility.

This apprehension was perfectly disproved by the reports of numerous well-experienced authors. There were reported but thirteen accidents: two deaths caused by sudden obstruction of the tube, 10 deaths caused by spontaneous detubage, and one in consequence of suddenly reappearing stenosis after extubation, absente medico.

My report given to the Gesellschaft fuer Kinderheilkunde at the Seventy-first Congress of German Naturalists and Physicians in September, 1899, stated, that: "the practitioner will have the same right—not to say obligation—to use if necessary and carry out intubation, and 2, the endolaryngeal method will give to him as well as the clinician much better results than tracheotomy.

The discussion following my essay proved that the number of opponents to private intubation was apparently reduced, on the face of these facts. Only one speaker emphasized the necessity of medical surveillance on consideration of the great dangers.

If we demand constant medical surveillance, intubation is out of the question. But at all events, we are obliged not to acquiesce with the results already gained, but to aspire to further perfection of the method, and this as long as intubation is accompanied by dangers, even very remote. On this behalf we ought to consider three points:

1. What common duties arise for the physician to undertake an intubation? 2. What method of technical execution is to be mostly recommended? 3. Which model of tubes hitherto existing is preferable to other ones, and is an improvement of the instrumentarium desirable and possible?

1. There is but one opinion about the first point: A physician should not proceed to the operation until he has sufficient previous practice on cadavers and animals. Besides he is to give instruction to the parents about the advantages and disadvantages of the bloody as well as the bloodless method; the alternative should be left to the parents. He should personally supervise the patient as well after introduction as after extraction of the tube as long as a momentary danger could be thought of. He should leave the patient only under the care of a reliable and well-instructed person, or nurse, and should never retire too far or too long from the patient.

2. As to the technique, it is rather indifferent how the tube is inserted if the operator succeeds in placing the tube quickly and without injuring the mucous membrane of the larynx in any way. It is a different question which caliber of tube is to be chosen. If the execution of the operation is a matter of manual ability the choice of the tube for the single case is the matter of clinical experience. Generally speaking one can say: If there are no especial indications to choose a tube of small caliber for the purpose of intermittent intubation, according to Francis Huber, tubes of that size are preferable which can just pass the larynx without being forcibly pushed in. The possibility of delicate introduction is always the condition sine qua non, otherwise the large caliber will be the best safeguard in preventing the most disagreeable drawbacks of intubation, sudden obstruction

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and spontaneous detubage. Certainly another danger of intubation seems hereby increased: The danger of making a false passage. But this will occur very seldom if we do not injure the mucous membrane while inserting the tube, and besides we know no means now to prevent the danger. In the first place we are able to abbreviate the treatment by early injecting the required amount of antitoxin, and secondly we can use tubes of a material which will not be injured by the secretions of the mucous membrane, and vice versa will not injure the latter on its part. There is not much to be said about the operation itself. Manual ability and clinical experience are individual matters and will always call forth great difference in the results of the operators. But as to the instruments, the question is deserving of further discussion and a perfection of them might be for the general good.

3. Which model or kind of tubes now existing is preferable? As I know by my rather extensive international inquiry the opinion of nearly all the experienced intubators, I may define the question more precisely: Which model of O'Dwyer's tubes is preferable? The French tubes of Courts and similar ones may serve quite well in some cases, but they have not been received everywhere and this for good reasons.

Let us examine the models in proportion to the dangers of intubation. As to sudden obstruction it is rather indifferent which kind of tubes we use if we only take tubes with as large a lumen as possible and while introducing them avoid forcibly detaching membranous casts. The danger of detubage is best eluded by using tubes which remain in the larynx as firmly as possible. O'Dwyer himself has modified his tubes for this purpose providing them with a second swelling or bulge at the end of the tube. The effect is an excellent one. Spontaneous detubage happens rarely with these tubes. The third drawback of intubation remains—the danger of detubation. Here the material as well as the construction has to be taken into account. The tube must be of such quality that no harm is done to the mucous membrane in any way. So it must not have sharp edges and corners; it must be fitted as much as possible to the configuration of the larynx and trachea, it should not press nor irritate the mucous membrane.

In comparing the metal tubes of O'Dwyer with the model he last invented, the rubber tubes, we already see by simple theoretical consideration the superiority of the latter ones. The rubber tubes provided with the second swelling above mentioned will be very seldom coughed out; besides, being five times less heavy than the metal ones, they exercise less pressure on the mucous membrane, and finally they are made of a material which is very resistant to chemical influences and can be made very smooth. As not theory but practice decides in such questions I again undertook a little inquiry the results of which, with one single exception, were exactly what I expected. I used rubber tubes in six cases last winter and did not see difficulties of deglutition or obstruction, detubage or decubitus, though there were some severe cases.

Besides, I proved them in my course on intubation, introducing in adults at first the metal tube, without swelling at the end, for children of 13 years, afterward inserting the rubber tube of the same size. While the latter one remained in the larynx, even if there was violent choking, vomiting and coughing, the metal tube was always coughed out promptly. I had similar experience in my practice with children. The cause of this

I see is the better adhesion of rubber to the mucous membrane.

To confirm my own observations I applied to Bokay, of Budapest, Bonain, of Brest, Dillon Brown, A. Caille and Louis Fischer, of New York City, Massci, of Naples, and E. Rosenthal, of Philadelphia. These gentlemen had intubated some hundred cases with rubber tubes, and state, excepting Rosenthal, that in using rubber tubes with suitably large caliber, accidents, such as obstruction, detubage and decubitus, occurred less frequently than with metal tubes. The reason for this is the light weight of rubber tubes, especially since the material does not suffer under the influence of the secretions of the mucous membrane as any metal will do. On this tube even in long use no concretions will be deposited which would injure the smoothness of the tube, and vice versa the mucous membrane. As a particular advantage of the rubber tube it is noticed by Bonain that they give less difficulties of deglutition on account of their light weight. Massei notes that in the new instrument set there are seven tubes instead of six, and so a better caliber will be possible.

Rosenthal alone reports bad results with rubber tubes. He noticed deposits as often as in the metal tubes. In 25 per cent. out of eighteen cases he stated decubitus, in three instances sudden heart failure. He also observed difficulties when he was ready to remove the tube on the fourth or fifth day. A decided reason for this he can not give.

Yet the reports of the other authors and of my own experience are so favorable as to the rarer occurrence of accidents as well as to the final results that we might dare to recommend the rubber tubes for common use. However, the report of Rosenthal requires us to act with great precaution and urge a further perfection of the instrument.

Commonly it is wrong to let theory speak before practice, but my propositions shall serve first to point out the weak points in our instruments, and besides I believe that if you, gentlemen, think my ideas good, you will be able to transpose them into practice quicker and easier than I can in this country.

I am of the opinion that very many lesions of the mucous membrane of the larynx, especially such done by beginners, originate in this, that the operation is still performed with an instrument entirely inflexible. If we should have the handle of the intubator manufactured in a material moderately springy, the instrument would have a certain latitude and could during insertion rebound better from an obstacle. Grave lesions, the forcing of wrong passages would be in future nearly impossible, as the operator would have his action better in control. Naturally the slide of the intubator, which is also now rather imperfect, would have to be omitted and the management should be altered in such a way that the erected index would lie on the obturator to regulate the pressure and to prevent an undesirable giving away. To give a support to the finger it would be necessary to broaden the obturator on its adjoined piece so as to level it on the top. Intubation would then resemble to a certain degree the harmless introduction of a hard-rubber probe.

We approach this idea still more if we also modify the construction of the tube. If you examine a rubber tube you will notice that the lower part of it occluded by the head of the obturator does not show a perfect rotundity. The tube's large end is horizontally cut off. The head of the obturator projects without transition like a long top, consequently it is undisputably more

difficult to insert rubber tubes than the original metal tubes, because the former are much easier entangled by their broad bases especially in cases of cicatricial stenosis of the larynx. It can become almost impossible to introduce them, while probes even of large caliber can pass easily. For the same reason I think the mucous membrane will be lacerated by rubber tubes if the operation is not carefully executed.

The necessary modification is not difficult to be found. The lower swelling of the tube must be diminished so that the outlines will show a regular oval. The point of this oval is formed without transition by the head of the obturator. The lengthening necessary is insignificant. I hope I shall very soon succeed in demonstrating to you a model of it.

There is still another drawback to be removed, which is less important in rubber tubes, but as it could be the cause of decubitus in cases in which the mucous membrane is extremely delicate it merits our full interest. L. Bauer has first called our attention to the fact that the vertical axis of the trachea in children is deviating backward—to the vertebral column—from the axis of the larynx, and this the younger the child is. Bauer has limited his anatomical studies to the material in the children's hospital in Budapesth, and it is possible that his trustworthy though unconfirmed observations are confined to singularities of race of the Hungarian population. A deviation in such a high degree—168—will probably not be the rule in other countries. But as everywhere it is stated that next to the cricoid cartilage the anterior wall of the trachea corresponding to the end of the tube is the favorite spot of decubitus, it follows that the observations of Bauer must be correct, at least in a general way. Besides, you can ascertain on sections of the head that the end of the tube is riding on the anterior wall of the trachea so that in vivo there must be in speaking, coughing, and swallowing a continuous friction. Based on these observations, Bauer constructed proper tubes of metal. The vertical axis of these showed a considerable recurvation backwards; the ordinary swelling of the tube was lowered some millimeters also to avoid a pressure of the cricoid. These tubes are not yet in vogue and were not liked in the few clinics—Budapesth and Leipzig—where they have been used; above all, it was said that they were rather difficult to be inserted into the larynx. Yet it must be noticed that decubitus occurred with them less often. One can understand this, as the front part of the trachea is discharged and thus I propose to also give the rubber tubes a small incurvation backward from the middle swelling. This should not be as pronounced as in Bauer's tubes. The transferring recommended by Bauer of the middle swelling to the height of the first cartilage of the trachea I think a mistake, as thereby the tube loses one of its best supports and can rub against the cricoid more than ever whilst the larynx is ascending and descending.

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**Roussel's Sign in Incipient Tuberculosis.**—The *Semaine Médicale* of November 28 states that experience has confirmed the accuracy of the sign pointed out by Roussel as an indication of tuberculosis in its early stages, namely, the sharp pain caused on light percussion in the subclavicular region between the clavicle and the third or fourth rib, originating 3 to 4 cm. from the median line and extending to and beyond the shoulder and the suprascapular fossa. Occasionally the subspinal fossa is sensitive to pressure. He attributes this cutaneous hyperesthesia to a reflex neuritis or myositis from propagation. In every case it is exactly over lesions of dry pleuritis in the apex. He has noticed it recently in a young woman who is a hysteric with absolute anesthesia.

## TRAUMATISM DURING INTUBATION—ITS PREVENTION AND TREATMENT.\*

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In studying the literature of the O'Dwyer method of intubation we should really feel that everything that can be said in favor of or against it has been mentioned, and still we find a great deal requiring more careful elaboration; thus, the question of decubitus has not been given as much prominence as it deserves. True it is that all intubators must have found laryngeal ulceration resulting from pressure of the tube, and O'Dwyer, and later, Variot, the chief of the Trousseau Hospital, and his associate, Bayeux, besides Glover, Baudrand, and Marie Schultz, are among those whose attention has been directed to this particular portion of the subject. The French collective pediatric study of Grancher, Marfan and Comby on this subject appeared in a publication entitled "Laryngites Traumatiques Consecutives Au Tubage." This is the most valuable contribution to literature that can possibly be imagined. It seems as though the enthusiasts for intubation have been afraid to publish their clinical results, more especially their decubitus cases, owing to the fear of burying this valuable operative measure in the same manner as the Bouchut intubating method disappeared in the fifties. Let us hope that a careful study of this serious interference with the blessings of this operation will disappear and that the operative treatment of fibrinous laryngitis will be the same the world over as it has been in the United States, and that intubation will supersede the bloody operation of tracheotomy.

Since 1891 I have operated and observed more than 1200 intubation cases in the hospital under my immediate supervision. I had always noted traumatism following intubation in a series of cases, so that I now desire to lay this matter before you to encourage discussion.

Traumatism can result during the act of intubation in three periods: during the introduction of the tube, while the tube is in place, when the tube is withdrawn.

I shall follow the classification of Variot and divide this into three parts:

1. Traumatism may result "from denuding the mucous membrane or, in the formation of a false passage." Massei, the Neapolitan laryngologist, speaks of fracture of the tracheal rings during intubation. Slight lesions of the mucous membrane are mentioned by O'Dwyer, Jacques, Gillet, Valdemar, Damm, and Variot. If it is necessary to intubate often, and in short intervals, and that the mucous membrane will be injured repeatedly, then it certainly will be a serious matter for a laryngeal diphtheria in which the larynx already in a pathological state receives additional traumatic lesions. Such deep-seated lesions might result during the introduction of the tube if subglottic swelling or very thick pseudo-membranous masses obstruct the entrance to the tube. Hemorrhage has been known to occur in case of an abscess opened by the introduction of the tube.

2. Dillon Brown speaks of false passages, as early as 1887. He mentions two distinct cases ending fatally. In one, the tube perforated the ventricle of Morgagni

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