Address.

MANUEL GARCIA.*

BY JOHN W. FARLOW, M.D., BOSTON.

TO-DAY there was celebrated in London the one hundredth anniversary of one who, still living and active, has well been called the father of laryngology. There is probably no laryngological society in the world which has not sent its letter of congratulation to the distinguished centenarian, Manuel Garcia, in recognition and appreciation of the great service which he rendered to the whole world by his successful laryngoscopic examinations of the larynx, and his paper entitled "Physiological Observations on the Human Voice," which gave such impetus to the examination, diagnosis and treatment of laryngeal disease that speculation and deepest ignorance soon gave way to the science of laryngology.

Let us inquire what his antecedents were, what sort of a man he was and what led him, who was not a medical man, but a singing teacher, to make his experiments on the larynx. According to Chorley, the great English musical critic, the Garcias were a Spanish family of musicians and representative artists whose power, genius and originality have impressed a permanent trace on the records of the methods of vocal execution and ornament. The father of Manuel Garcia was Manuel Garcia del Popolo Vicenti, born in Seville, Spain, in 1775. He began his artistic life at six years of age as chorister at the cathedral, and studied music under the best masters of Seville. At the age of seventeen, he made his début at Cadiz in an opera of his own composition. Later he went to Italy and studied the Italian method. He appeared in opera in Paris in 1808, where he was received with much applause and his style of singing was greatly appreciated. In 1824, he went to London and thence to New York, in 1825, with a company of excellent artists, among them his son, Manuel, and his daughter, Maria, better known under her subsequent name of Malibran, one of the most famous opera singers the world has ever known.

They appeared in Italian opera in New York with much success, and later went as far as Mexico. They were on the point of returning to Europe, when he was set upon by brigands, on the way to Vera Cruz, and robbed of his well-earned wealth, about thirty thousand dollars. He had hoped to found an Italian theatre in New York, but the loss of all this money compelled him to return to Paris, where he soon retired from the stage and devoted himself exclusively to teaching, until his death in 1832. His method of singing was unsurpassed, and some of the most celebrated singers were his pupils, among them his son, Manuel, his daughter, Mme. Malibran, whom I have already mentioned, and also his daughter, Pauline, Mme. Viardot, who became very famous as an opera singer. He wrote excellent treatises on the art of singing.

His son, Manuel, was born in Madrid, March 17, 1805, just one hundred years ago to-day. He studied music under various teachers in Madrid and Paris and later under his father. His lessons were interrupted in 1825, when he was twenty years old, by his journey to New York with his father's opera company, in which he sang second bass. After his return to Europe he gave up the theatre and assisted his father in teaching singing at Paris. He studied seriously the conformation of the vocal organs, the limits of the different registers of the voice and the mechanism of the larynx in singing and presented the subject at the Academy of Science in Paris in 1840, in a work entitled "*Mémoire sur la Voix humaine*," and received the congratulations of the Institute

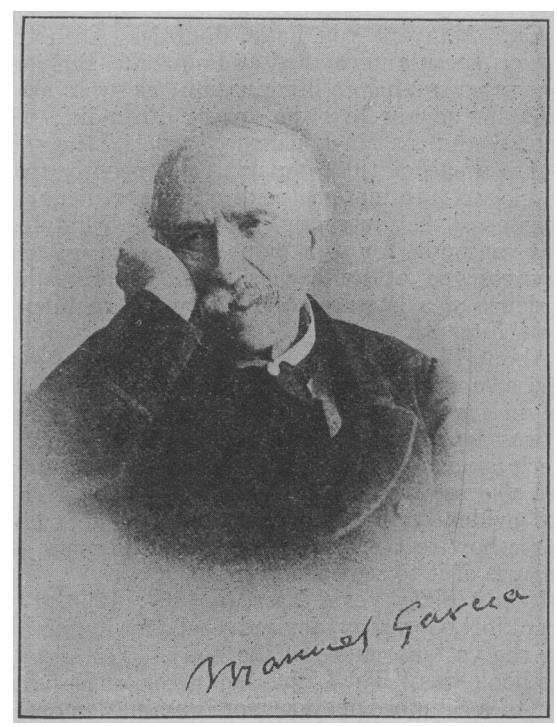

FIG. I. Manuel Garcia.

for it. He was Professor of Vocal Music at the Paris Conservatory of Music from 1842 to 1850, and published a book in two parts on singing, for the use of pupils and especially of teachers, an excellent work containing many novel ideas. In 1850, he went to London and became Professor at the Royal Academy of Music. His wife, whose maiden name was Eugénie Mayer, was one of his pupils and became a noted opera singer. He has trained the voices of many of the most famous artists, among them Jenny Lind. Of late years he has lived in London and his address is Mon Abri, Cricklewood, London. We see that he was no ordinary music teacher. Of a distinguished musical family, he had been interested in the throat, the larynx and the voice for many years and had published, as early as 1840, a

*Read at the meeting of the New England Otological and Laryngological Society, March 17, 1905.

treatise on the voice worthy of the commendation of the French Academy.

Let us look for a few moments at the attempts of the predecessors of Garcia to see the larynx in the living, human subject. In these days, when the study of laryngology is compulsory for a medical degree, and when every student is obliged to have a fair amount of attainment in the use of the laryngeal mirror, it seems strange to read, in an article published by Yearsley in London, in 1862, seven years after Garcia's paper and four years after Czermak's demonstrations, that he feels that the subject is such an important one that he hopes there will be in every large city at least *one* practitioner who is expert in the use of the laryngoscope.

It is probable that dental mirrors had been used at intervals from time immemorial for examining the teeth, and polished tubes for looking into the external canals are of very ancient origin. Many of you have, doubtless, seen the various specula unearthed at Pompeii. But it is necessary to have illumination as well as a reflecting mirror in order to see down into the larynx, and, as Mackenzie well says, "the fact that it was not till comparatively recently that physicians attempted to discriminate between diseases of the fauces and those of the windpipe, may account for the non-appearance of the laryngoscope at an earlier date. There is no evidence of a laryngoscope before the middle of the eighteenth century."

About 1743, M. Levret, a French accoucheur, devised a sort of speculum to aid him in removing polypi from the nose and throat by ligatures. It was a plate of polished metal which reflected the luminous rays in the direction of the tumor and also received the image of the tumor. This was evidently merely something to enable him to see how to tie his ligatures, and he made no real use of it to see the larynx.

Nearly sixty years later, in 1804, Bozzini of Frankfort, Germany, devised a tube for illuminating the various canals of the body. The title of the book was "The Light-Conductor, or Description of a Simple Apparatus for Illumination of the Internal Cavities and Spaces in the Living Body." An absurd idea was commonly held that the apparatus would permit an inspection, not only of the outlets of the body, but even the internal viscera. The medical faculty, particularly that of Vienna, was down on him for his pretensions and styled his instrument the "Magic Lantern in the human body."

His invention, of which I show you a drawing, consisted of two essential parts, first a kind of lantern and second a number of hollow metal tubes (specula) for introducing into the various canals of the body. The lantern was vase-shaped, made of tin, in the center of which was a small wax candle. In the sides of the lantern were two round holes, a larger one and a smaller one opposite each other. To the smaller, an eye piece was fixed, and to the larger the speculum. The flame of the candle was situated just below the level of these two apertures. The mouth of the speculum, a tube of polished tin or silver, was always of the same size, but the diameter of the tube beyond the orifice varied according to the size of the canal into which it had to be introduced. The apparatus was about thirteen inches high and at the downward bend of the laryngeal

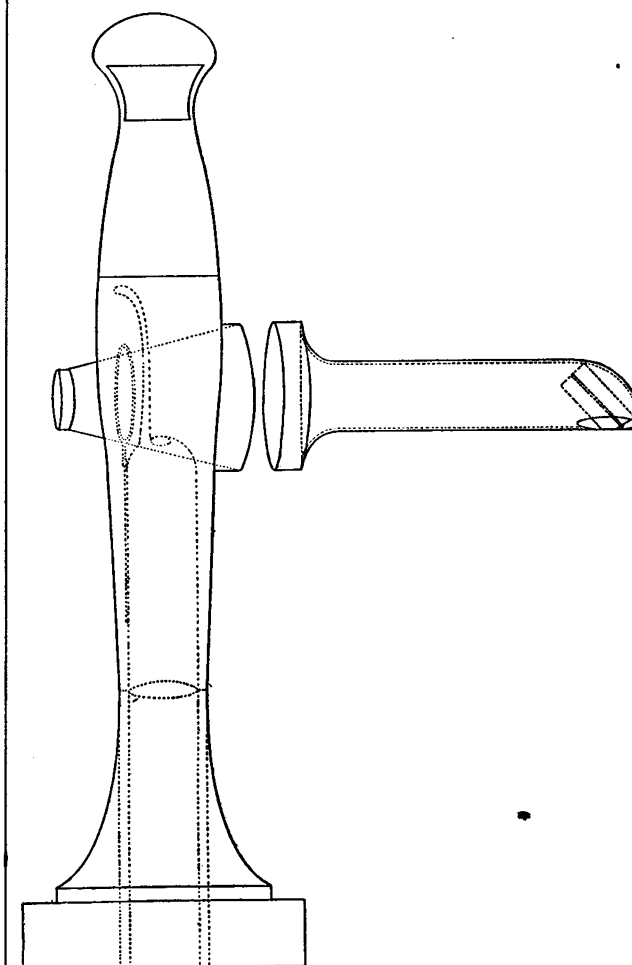

FIG. II. Laryngoscope of Bozzini, showing the vase-shaped lamp with candle inside. The speculum with the two small mirrors at the bend is to be attached to the larger opening in the side of the lamp. For looking down into the larynx, the small end of the speculum is directed downwards, and it can be turned upward when the post-nasal space is to be examined.

tube were two mirrors. In employing reflected light he had the speculum divided by a vertical partition, so that there were two canals and two mirrors, one to convey light and one to receive it.

Later I will give some of the objections to the value of such tubes in the throat. Suffice to say here, that nothing of value came from its use in the throat.

In 1827, Dr. Senn, of Geneva, had a little mirror constructed for introduction to the back of the pharynx, with which he tried to see the upper part of the larynx, but he gave up its use on account of the small size of the instrument.

In 1829, Dr. Benjamin Guy Babington, at a meeting of the Hunterian Society of London, showed an instrument, not very unlike the laryngoscope now in use, for examination of the parts within the fauces not admitting of inspection by unaided sight. He used two mirrors: one, the

smaller, for receiving the laryngeal image in the throat, and the larger for concentrating the solar rays on the first one. The patient sat with his back to the sun, and, while the illuminating mirror (a common hand looking-glass) was held in the left hand the laryngeal mirror was introduced into the mouth with the right hand. By

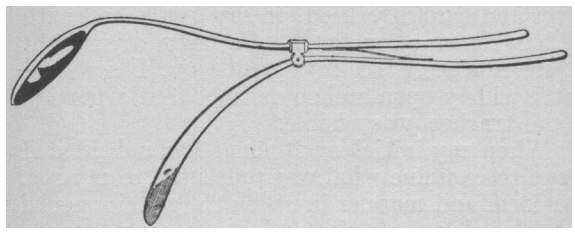

Fig. III. Glottiscope of Babington, showing the laryngeal mirror and the tongue depressor.

a simple mechanism, a tongue depressor was united with the laryngeal mirror and thereby one of the most serious obstacles to laryngoscopy was attempted to be overcome. A spring was fixed between the shank of the laryngeal mirror and the spatula in such a way that by pressing the two handles together the tongue was depressed. At a later period he gave up the combination of mirror and spatula and had mirrors made which resembled those now in use. They were of polished steel inclined to the shank at an angle of about 120°. Though he used his mirrors on many patients, there are no cases recorded in which it was employed. He made a decided advance over Senn, who used merely a laryngeal mirror and no mirror for throwing in light. The difference between Dr. Babington's glottiscope, as he called it, and the one now in use is that, while in the latter the light is thrown on the laryngeal mirror by a circular mirror attached to the forehead of the operator, in the former the illuminating was effected by a mirror held in the operator's left hand and also no artificial light was used.

In 1832, Dr. Bennati, of Paris, asserted his ability to see the vocal cords. A mechanic named Selligue, who was suffering from tubercular laryngitis, had invented a double-tubed speculum, of which one tube served to carry the light to the glottis, and the other to bring back to the eye the image of the glottis reflected in the mirror placed at the pharyngeal end of the tube, and his larynx was examined and treated by Bennati by means of this apparatus.

Trousseau, the great French clinician, had a similar tube made for himself, but found it of very little value, as not more than one patient in ten could tolerate it. He says, "it is of such a size that it fills up the space between the free edge of the soft palate and the tongue. It causes gagging, retching and closure of the pharynx, which prevents a view of the parts lower down," and he asserts that "Bennati is in error in saying that he has seen the glottis with the speculum of Selligue. He saw only the upper part of the epiglottis and very rarely the superior entrance of the larynx and that only when the accidental straightening out of the epiglottis permitted." Trousseau recommends, instead, a digital examination of the larynx, which shows what he thought of specula.

In 1838, Baumès showed at the Medical Society of Lyons a mirror about the size of a two-franc piece, which he described as very useful for examining the posterior nares and larynx, but no cases are recorded.

In 1840, Liston, a Scotch surgeon, in his work on practical surgery, in treating of edematous tumors which obstruct the larynx, says: "The existence of this swelling may often be made out by a careful examination with the fingers and a view of the parts may sometimes be made out by means of such a glass as is used by dentists, on a long stalk, previously dipped in hot water, introduced with its reflecting surface downward and carried well into the fauces." Although much credit has been given to Liston, it is obvious that he never contemplated an inspection of the vocal cords. It is plain that he thought the sense of touch was more to be relied on than that of sight, and he evidently referred to the epiglottis rather than the parts below.

In 1844, Dr. Warden, of Edinburgh, reported two cases in which he had been able to see the glottis by means of a tube and two prisms, one for throwing light into the tube and the other placed in the pharyngeal end of the tube for deflecting the light down on to the glottis. To

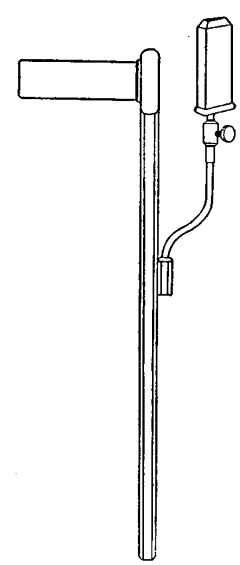

Fig. IV. Laryngoscope of Warden. A hollow canula with a long handle to which is attached a prism. This can be turned in various directions in order to divert the light from a lamp into the canula. A small prism with a metallic handle is then passed along the floor of the canula to its laryngeal end, where it serves to divert the light down to the larynx. This second prism is not shown in the figure.

facilitate the examination (which the patient evidently found rather strenuous) he advised quieting the irritability of the throat by touching it with the finger, depressing the tongue, dilating the fauces and encouraging the patient to swallow in order to lift up the arytenoids and the epiglottis. Such a method was of no practical value.

In 1844, Mr. Avery, of London, made use of a circular reflector, perforated in the center, for concentrating the light on a laryngeal mirror. This was attached to a head-band worn by the operator. The reflector was five inches in diameter and the apparatus worn on the head weighed a pound. The small laryngeal mirror was placed at the end of a speculum, as in Bozzini's case, but it was very difficult to use on account of its irritating the throat. No cases seen with this instrument are recorded, and it was not published until after Garcia's paper.

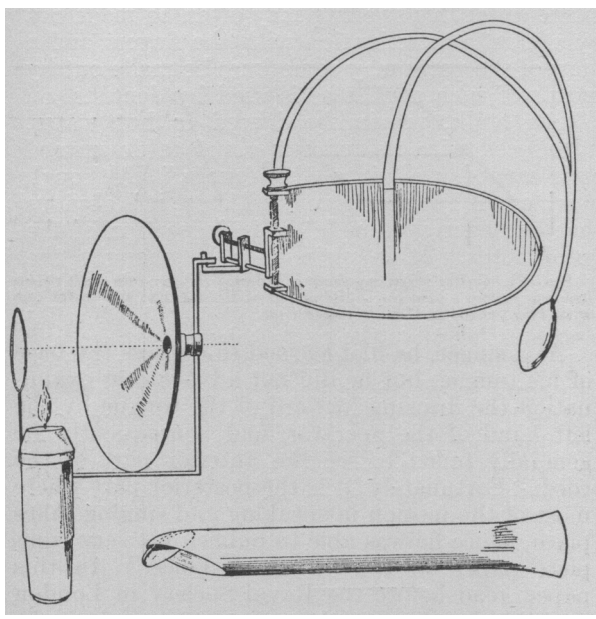

FIG. V. Avery's Laryngoscope. Head band, mirror, lamp speculum with mirror inside, handle of small mirror not shown in figure.

All the experiments up to this time had produced no practical result as far as knowledge of the larynx was concerned. The larynx as a whole had probably never even been seen and, consequently, the physiology and pathology of the organ were no further advanced than in the early part of the nineteenth century. An isolated, incomplete examination, followed by no theoretical or practical advantage, merely a medical curiosity, which did not impress even its inventor as having any special value, — such was the state of knowledge, or rather ignorance of the living larynx, when, in 1854, while on a vacation in Paris, Manuel Garcia undertook a series of laryngoscopic examinations on himself for the purpose of studying the action of the larynx in the production of the voice. He was unaware of what had been done by his predecessors; in fact, they had not done much that could help his studies.

"One day in September, 1854," he says, "when I was sauntering about the Palais Royal, busied with the wish often put aside as unattainable but yet always urgent, namely, to see the glottis during the act of singing, I suddenly saw both mirrors of the laryngoscope in their respective positions as clearly as if my eyes actually beheld them. I immediately hastened to Charrière, the instrument maker, and in answer to my inquiry if he happened to have a little mirror on a long handle, he replied that he had a small dental mirror which had been exhibited in the London Exposition of 1851, but which had been found unpractical. I bought it for six francs. After procuring a small hand mirror, I hastened home in great impatience to begin my experiment. I laid the little mirror, which I had warmed in hot water and carefully dried, on my uvula, and with the hand mirror concentrated a beam of sunlight on its surface. To my great joy, I saw the glottis widely open and so distinct that a portion of the trachea was visible.

"When my initial excitement had subsided, I began to examine what was presented to my eye. The form and manner in which the glottis opened and closed noiselessly and its movements in phonation filled me with astonishment."

He was the first to conceive the idea of an autoscopic examination. He directed that the person experimented on should turn towards the sun so that its rays falling on the little mirror in the throat should illuminate the glottis. He also said that if the observer experimented on himself he should, by means of a second mirror, receive the sun's rays and direct them on to the throat mirror. He occasionally advised the use of a perforated head mirror, when he was being examined by another person.

In 1855, just fifty years ago, he presented before the Royal Society of London his paper entitled, "Physiological Observations on the Human Voice," which contained the first, and a very admirable, account of the action of the cords in inspiration and vocalization, some very important remarks on the production of sound in the larynx and also valuable reflections on the formation of chest and falsetto tones.

This paper created little stir at the time, and was treated with apathy, if not incredulity. It was known that he had a very tolerant throat which he, as a trained singer, had under perfect control, and his observations were thought to be merely personal and not of universal application. The fact that he was not a medical man may have lessened the interest of physicians in this epoch-making discovery.

His paper, however, passed into the hands of Türck of Vienna, who, two years later, in 1857, during the summer months, employed the mirrors and methods of Garcia on himself, and also at the Vienna General Hospital; but the uncertain light and the frequent absence of sun made him inclined to lay aside his studies, and he even declared that he was "far from having and exaggerated hopes about the employment of the laryngeal mirror in practical medicine." He was a fine musician and an able physician any was much helped in the publication of his classical work on "Diseases of the Larynx," which he published later, by Dr. Effinger, a noted water-color artist, who illustrated the conditions seen in the laryngoscopic cases which came under Türck's care after the method had been perfected by Czermak.

This final step in the progress of laryngoscopy

was made by Czermak, Professor of Physiology in Pesth, in Hungary. He had a very large pharynx, small tonsils and uvula, and was a splendid subject for laryngoscopy.

In order to study the production of certain guttural sounds, such as occur in the Arabic language, in 1857, he borrowed from Türck the little mirrors which the latter had thrown aside as useless. In order to be independent of the sun and weather, he substituted artificial light for sunlight and made use of the large concave, ophthalmoscopic mirror of Ruete for concentrating the luminous rays. Full of enthusiasm, he made journeys to Germany, France and England, journeys which were considered impossible, at that time. By his demonstrations on himself and others, he compelled an interest and knowledge of this new discovery, and at this time the "Science of Laryngology" took its origin. In 1858, he published his first essay, entitled: "Physiological Researches with the Laryngeal Mirror of Garcia," thus showing the importance he attached to the work that had been done by Garcia.

At the time of Czermak's great activity a marked controversy arose between him and Türck in regard to various questions of priority in the use of these mirrors and methods. The rivalry, unfortunate for the two individuals, had the effect of attracting attention to the subject and, in a way, was a means of making known the merits of this new mode of diagnosis and treatment.

It would be unpatriotic did we not mention a fact, probably unknown to most of you, that Massachusetts has also had a small share in the history of laryngoscopy. In January, 1858, Dr. Ephraim Cutter, of Woburn, Mass., in conjunction with Mr. G. B. Clark, of Cambridge, the noted lens and telescope maker, devised a laryngoscope similar to that of Bozzini. It consisted of two tubes, one for observation and the other for illumination, and at the oval, pharyngeal end was a prism to divert the rays of light into the larynx. I can show you a drawing of Cutter's proposal and also of what Clark wished to substitute, but I am not aware that it came to any practical use. Perhaps some of the older members of this society may know something of its fortune.

Looking over the various experimenters whom I have mentioned, we may say, in a general way:

(1) Bozzini first attracted attention to the importance of seeing into the different cavities of the body, and to some extent succeeded.

(2) Babington was, in a certain sense, the discoverer of laryngoscopy.

(3) Baumès, Liston and Warden and Avery made apparently independent efforts to examine the larynx.

(4) But to Garcia is due the merit of having first made an extended series of examinations of the healthy larynx.

(5) And to Czermak must be awarded the praise of having diffused the knowledge of the instrument and shown its value in the study of disease.

The tubes and specula had no practical result. The mirrors of Babington and Liston and the illumination of Avery were not so very unlike what we have to-day. But no knowledge of the larynx, no literary contribution, came until Garcia.

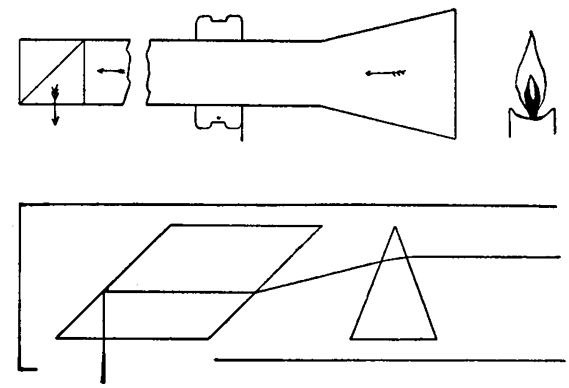

FIG. VI. Cutter's Laryngoscopic Tubes. Upper one with prism inside is Cutter's idea for illumination of the larynx, and lower one with two prisms is Clark's suggestion.

As a singer, he had learned to depress the base of his tongue, but he did not advocate in examination the drawing forward of the tongue by the left hand of the operator, and, consequently, he generally failed to see the anterior part of the cord. Fortunately, it is the posterior part where most of the motion in speaking and singing takes place, hence he was able to publish his very complete paper on the "Human Voice." In this paper, read before the Royal Society in London in 1855, he says: "At the moment when the person draws a deep breath, the epiglottis being raised, we are able to see the following series of movements: the arytenoid cartilages become separated by a very free lateral movement, the superior ligaments are placed against the ventricles, the inferior ligaments are also drawn back. though in a less degree, and the glottis, large and wide open, is exhibited so as to show in part the rings of the trochea. As soon as we prepare to produce a sound the arytenoid cartilages approach each other and press together by their anterior surfaces without leaving any space. Sometimes they even come into so close contact as to cross each other by the tubercles of Santorini." These are certainly the words of one who has seen critically, exactly and repeatedly, not only the epiglottis, but the cords and the whole larynx. He gave also very valuable information on the chest, head and falsetto registers, and showed that the vocal cords and not the ventricular bands exclusively form the voice, whatever its register or intensity. Although not a medical man, his work was considered so valuable that he was given an honorary degree of M.D. by the University of Königsberg, in Germany.

I have tried to bring before you a few facts in regard to the artistic and highly musical antecedents and surroundings of Manuel Garcia; his great success as one of the most famous teachers of singing in the world, his painstaking studies

of his own larynx, after so many others had failed or their efforts had resulted in nothing of value; his noteworthy paper before the Royal Academy, the first *exposé* of the appearance and action of the living human larynx; his honorary medical degree; the fact that his mirrors were used by Türck and Czermak, who, especially the latter, amplified and improved the art; and more especially by his demonstrations and journeys made known to the medical world the possibility of seeing and treating the larynx and thus making possible the science of laryngology and rhinology.

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Original Articles.

A METHOD OF PRODUCING ETHER NARCOSIS BY RECTUM, WITH THE REPORT OF FORTY-ONE CASES.

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THE idea of producing narcosis by injecting ether vapor into the rectum occurred to the writer while serving as house surgeon under Dr. Abner Post at the Boston City Hospital in 1903. This idea was founded upon the fact that rectal enemata were so successfully absorbed. The subject was suggested to Dr. Post, who informed him that the method was an old one, and the writer was referred to an article written by Dr. Post in 1884, when he and Dr. George W. Gay employed the method in a few cases at the Boston City Hospital. A careful search of the literature revealed the following history:

The first mention of producing ether narcosis by the rectum appears in Pirogoff's book on etherization, published in 1847 in St. Petersburg. About the same time Roux[1] made experiments upon the subject, as did Vincente y' Yhedo and Marc Duprey, employing injections of ether pure and mixed with water. Their observations, although demonstrating the practicability of this method of producing complete anesthesia, excited little interest.

No mention of the practice appears again until 1884, when Molliere,[2] following the suggestion of Dr. Alex Yversen of Copenhagen, employed the method at l'Hôtel Dieu de Lyon and established its merit. His experiments were made with a simple apparatus similar to that employed by the earlier investigators. It consisted of a large bottle almost filled with ether from which a tube conducted the vapor to the rectum. The bottle was placed in a water bath which had a temperature greater than the boiling point of ether. By this means the ether was made to boil, and by its own volatile expansion was carried over into the rectum. Molliere produced complete anesthesia in from ten to twenty minutes, and used only a small quantity of ether (10 gms.) in so doing. Unlike the results of Pirogoff's and Roux's experiments, those of Molliere created considerable interest and several surgeons practiced the method with variable results.

Hunter[3] reports six cases which he summarizes as follows: "The method in question promises, in my opinion, to effect a radical improvement in the method of administering ether. A striking feature is the small quantity of ether required, showing how large a quantity is commonly wasted. The absence of any unpleasant sensations on the part of the patient is a matter of no small importance. The rapidity with which anesthesia can be induced and the general absence of struggling and opposition by the patient give the rectal method a decided value, even if it should be used only as a preliminary step to the usual method." Hunter makes no reference to diarrhea or other ill effects being produced by the employment of this method.

Weir[4] mentions seven cases where rectal etherization was employed by Dr. William T. Bull with the result that nearly all had bloody or simple diarrhea following, and that one case became collapsed afterward. He also cites two cases of his own. One was a boy fourteen years of age who received rectal ether for fifteen minutes, and although he became sleepy and the breathing sterterous, sensibility was not completely lost and etherization in the ordinary way became necessary. His other case was a robust child of eight months, upon which he operated for hare-lip. The child was fully anesthetized in three minutes and the operation completed successfully. The amount of ether used was in all less than two ounces. The child was "somewhat depressed" at the end of the operation, but rallied under stimulation and heat. During the night it had several bloody movements and died the following morning.

Wanscher[5] records twenty-two cases anesthetized by injecting ether vapor into the rectum

[1] Jour. de l'Academie des Sciences, xviii, 47, p. 146.
[2] Lyon Medical, 1884, xlv, p. 419.
[3] New York Med. Rec., 1884, xxv, p. 507.
[4] New York Med. Rec., 1884, xxv, p. 508.
[5] Cong. Internat. Med. Sciences, 1884, ii, p. 186, Sec. 1.