SYNTHESIS OF ALCOHOL.

ALCOHOL is easily oxidized into acetic acid, as the brewer knows to his cost, but the converse change has hitherto been unknown. The conversion of acetic acid into alcohol has been accomplished by M. Lapeyrière, who contributes the following account of his experiments to *La Nature*:

"In the porous vessel of a small size Bunsen cell, I replaced the nitric acid by a concentrated solution of very pure crystallizable acetic acid; the external compartment containing very dilute sulphuric acid. I then short-circuited the cell, and left it in action during a certain period (from April 29 to May 27). At the end of this period the acetic acid had disappeared from the porous cell, being replaced by alcohol in sufficient quantity to allow of my obtaining a few grammes of this substance by distillation. As I had foreseen, the acetic acid assimilated the hydrogen necessary for the production of alcohol. I found by a further experiment that the acetic acid was first converted into aldehyde, and afterwards, by a further absorption of hydrogen, into alcohol, the successive changes being expressed by the following equations, in the equivalent notation:

MANUFACTURE OF SODA.

By C. A. DE LA MARTELLIÈRE, Paris.

IN the manufacture of soda by the ammonia process the hydrochlorate of ammonia liquors are usually mixed with lime and distilled, so as to eliminate the ammonia, which is converted into bicarbonate by a current of carbonic anhydride produced by calcination of limestone. This invention relates to a process and apparatus for treating the liquors above mentioned to obtain from them the bicarbonate in a simple manner. For this purpose the hydrochlorate of ammonia liquors are heated for some time in a boiler to drive off the free bicarbonate which is collected. The liquors are then evaporated until the sal ammoniac is precipitated in vessels described in Specification 4353 of 1878. The precipitated sal ammoniac is drained and made into a paste with powdered carbonate of lime or dolomite, and

the mixture is slowly heated in retorts. Toward the end of this operation a little milk of lime is introduced into the retorts to decompose the last traces of sal ammoniac. The fumes are condensed in the special apparatus shown in the illustrations. A number of shallow vessels, A A, are immersed in a tank, B, through which cold water circulates. In the vessels, A A, are a number of partitions, a a, extending about half way down, so that their lower edges being immersed in the liquid, the fumes and gas introduced from the retorts into the first compartment by the pipes, C C, are caused to bubble from compartment to compartment and to become absorbed. Near the end is the receptacle, D, into which the solid precipitate is raked by the rake, E, for removal.

FLAYING OF THE VOCAL CORDS.

By Dr. CARLO LABUS, of Milan, Lecturer on Laryngoscopy in the Royal University of Pavia. Translated by Charles E. Sajous, M.D.

IN a pamphlet of twenty-four pages, Dr. Labus introduces a novel operation for the more rapid and permanent cure of chronic congestion of the vocal cords. The first pages of the monograph are devoted to the causes giving rise to the affection in question. After describing in a very clear manner the operation, the author gives a list of twelve cases (among whom are some prominent singers), showing results of a very satisfactory character.

The length of the paper not allowing its publication in full, the following extract will serve to show its principal points:

Considering the facility with which traumatic endolaryngeal lesions are cured, frequently without even leaving the least trace of the trouble (as I was able to convince myself in sixty cases of laryngeal tumors extirpated laryngoscopically), and guided by the criterion of analogy, that when loss of substance occurs in the superficial strata of mucous membrane repair takes place completely, the idea occurred to me to attempt the removal of that part of the membrane which had become hyperplastic, and wait for the formation of a new tissue, identical with the normal, and possessing all the qualities requisite for perfect phonation. To obtain this result it became necessary to create a traumatic lesion, avoiding unnecessary laceration, thereby diminishing the chances for excessive reaction, which would compromise an otherwise normal and rapid cicatrization. I thought to effect this by stripping the cord of the hyperplastic tissue covering it, using for that purpose an instrument such as Tuerck's polyp crusher, or a toothed forceps of some kind, with lower branches turned before or backward.

To succeed in performing so minute an operation, it is necessary that the patient acquire perfect toleration of the instrument, to obtain which I resort to repeated manipulation. This having been obtained, Türk Schrotter's method of anaesthesia may be used for the operation, but I am not disposed to advise it, the inflammatory reaction secondary to the application of chloroform retarding the recovery.

The operation is performed during inspiration; the cords being then separated, the hyperplastic mucous tissue presents itself so that it can easily be seized. If the inflammatory process extends over more tissue than the instrument can embrace, it becomes necessary to strip the whole affected extent. The operation is said to give but little pain. For the moment the voice becomes clearer, but very soon it becomes weaker and weaker, until complete aphonia exists, which lasts two or three days; this is caused by paralysis of

the superior fasciculus of the thyro-arytenoid muscle. The consecutive reaction is but very slight; the cords present slight redness and turgescence, the flayed space remaining perfectly white. As a general thing the lesion becomes cicatrized in three or four days, and nothing remains but a slight turgescence, which gradually disappears. The voice returns with all its delicacy and purity.

The consecutive treatment can be said to be negative. Pain, a slight burning sensation lasting a few hours, requires but little attention. Abstinence from irritating drink, smoking, and from breathing a vitiated atmosphere, or exposure to causes giving rise to coryza or bronchial catarrh, is necessary; but, above all, silence must be observed the first few days, in order to give the organ complete rest. Local medication, producing irritation, retards recovery. If, however, the reduction of the turgescence should be too slow, then only very weak astringent inhalations may be advised. The material condition of the cord operated upon does not allow the least exercise at singing for at least one month after the cure of the lesion, to secure complete absorption of the exudation and coaptation of tissues.

The idea of resorting to the above process came to me seven years ago, while having under treatment a celebrated singer. The mucous membrane of the middle third of the right vocal cord was raised, so to say, detached, rendering the voice impure, and strongly compromising a brilliant career. A local astringent treatment relieved her enough to allow her to return to the stage, but the improvement was but momentary. Impressed by this, I decided to attempt denuding the cord of its hyperplastic tissue in cases of like nature, and very soon an opportunity presented itself in the person of M. Roussel, a tenor. This artist, after a career of eight years, found himself forced to abandon singing, his voice having become defective. After a cold contracted some time before, his voice had remained impure. On the margin of the right vocal cord and on its anterior third the mucous membrane was somewhat relaxed and projecting, and during phonation vibrated with the cord. Having tried, without result, insufflations of astringent powders, I proposed the extirpation of the loose portion of the membrane, which was accepted as a last resort, a year's continuous treatment having proven ineffectual. After four days' manipulation I was able to touch the cord without exciting reflex action. On September 22, 1874, I prepared myself for the operation, and so as to obtain the highest tolerance possible, I resorted to local anaesthesia. Following the proceedings described above, the operation was performed without difficulty; the reaction was almost nil; the voice weakened for a day or so, but on the third had returned, and continued clearing so rapidly that in a week he could be considered as cured, the larynx not presenting the least trace of the lesion, and the margin of the cord being perfectly straight and smooth. As to his voice, in filling an engagement the following December, it was characterized as "admirable," by the papers of the day, and compared to that of Rubini.

In February, 1875, Signora Rosa Bellincioni, contralto, came to me, complaining that during the past year the least prolonged singing caused great fatigue and lowering of the voice. The right vocal cord was somewhat tumid and pinkish in its anterior and middle third, and its margin projected in the rima glottidea at certain points. I prescribed a local astringent treatment, and did not see the patient until the following February. She then related that she had followed my treatment, without advantage; that her voice was worse notwithstanding, since the year before she could reach G fourth octave, and now she could only reach E flat fourth octave, and that in that state she could absolutely not sing. On examination I found the same tumefaction as the year previous, only increased, and of a bright red. The operation being proposed and accepted, twelve days' manipulation of the larynx enabled me to master the organ so as to be able to perform the operation without anaesthesia. The voice instantly became clearer. There was no reaction, not even lowering of the voice. In twenty days the cord was perfectly white, and its border smooth and straight; the voice was very clear, and she could reach F sharp fourth octave. One month later it had taken its normal extension.

In May, 1876, Signora Flora Mariani, mezzo-soprano, came to me suffering with catarrhal pharyngitis, and stating that since winter her voice did not respond to her requirements; that she could not attack and sing in high register, and that it had lost its clearness. She had overused her voice; had sung parts too high for it; and, worst of all, had sung while under the effects of a cold. Besides the pharyngitis, I found both vocal cords reddish and tumid. I advised her rest and the use of a local astringent treatment. One month later she again called, with full intention to undergo thorough treatment. I began with astringent insufflations, with notable advantage at first, the left vocal cord, in fact, returning to its normal condition. After twenty days' treatment, not noticing much progress, the right vocal cord retaining its tumid condition, and encouraged by the results obtained in the cases narrated above, I proposed my new operation; that is to say, to strip the cord of the hyperplastic tissue which did not show a tendency to reduction. After a week's manipulation, on the 9th of July I extirpated the whole portion of tumid mucous membrane at once. The reaction was nil. At the end of two weeks her voice in speaking was natural. I did not allow her to sing before a month after the operation, the cord not presenting then the least trace of the lesion. Her voice was, in fact, admirable, and her high notes were as clear as before her illness. After a month's exercise at singing, the voice, instead of improving, began to weaken and lose its clearness. On examining the larynx I found the cord operated upon perfectly normal, white, smooth, with straight edge, but the left vocal cord was tumid and red throughout its whole extent. No doubt, the exacerbation of the same inflammatory process I had found on her first visit existing in both cords, but which had been temporarily mastered in the left by astringent medication and rest, had reappeared on resuming singing, the cord operated upon having resisted the labor imposed upon it. Naturally, the enthusiasm engendered by the success of the first operation led her to accept a second one very readily. In a few days I was able to introduce my forceps and extirpate the mucous membrane covering the left cord throughout its whole extent, which was done in three different applications, the instrument being too small to embrace it over its whole length. The pieces of mucous membrane were submitted to the eminent histologist, Prof. Bizzozero, who recognized them as composed of epithelium, a thin layer of connective tissue underneath, pervaded with a few blood vessels. This time there was marked hoarseness, but in ten days the cord was in its normal condition. A month later the voice had resumed its facility in attacking pianissimos,

while the "notes piquées" were true and clear. Very soon after she started for Venice, and filled an engagement with great satisfaction. I saw Signora Mariani a year later, and again this spring, and I was able to observe the perfectly normal condition of the organ laryngoscopically, while her voice was pure and metallic.

In autumn, 1876, came to the Ospedale Maggiore a chorus singer, Angela Allini, belonging to the Scala. Her voice, that of soprano, had become coarse, almost masculine, this having been brought on by overwork, especially while the organ was indisposed. A laryngoscopic examination revealed a fact which I had occasion to observe once before in a singing artist; besides the usual redness and thickening, there was on the superior layer a long white stria running longitudinally, and resembling an antheromatous patch. After six days' manipulation, I extirpated the superior mucous layer of both cords.

Forced by poverty to enter upon her duties sooner than I desired her to do so, the patient resumed her labors at the end of a week. She sang through the whole carnival, the result being merely a slight weakness in tone and a slight redness of the cords; but these were not in the least tumid.

In September, 1877, Dante Del Papa, a tenor, came to the hospital complaining of hoarseness. I found the right vocal cord congested and swollen. Not producing any relief with astringent applications, I performed the operation, with entire success. The reaction was very slight, the voice being hardly veiled at the end of three days. After a short period of rest the patient returned home, and shortly after I heard that he was filling an engagement with entire satisfaction.

The following are the conclusions which I believe to be able to advance:

1st. Catarrhal inflammation of the larynx is frequent among singers.

2d. Said inflammation has for its cause, besides rheumatic diathesis, the abuse of the functions of the larynx, and its use in pathological condition.

3d. It easily passes to chronicity, localizing on the vocal cords, these bearing the brunt of the functions of the organ and resulting in hyperplasia of the epithelial stratum and of the adjoining mucous layer.

4th. The result of this inspissation of the mucous membrane which invests the cords is an alteration in the voice, very often only noticeable during singing, but sufficient to impede the artist in exercising his profession.

5th. The treatment by topical applications is long, seldom giving rise to complete cure; oftener produces but a short amelioration, and in most cases fails completely.

6th. The process of flaying is not only innocuous, but gives more complete and lasting results, and that in shorter time, constituting the true radical treatment of hyperplastic inflammation of the vocal cords.

COLD AS A CAUSE OF DEAFNESS.

DR. THEODORE GRIFFIN of La Prairie, Ill., says, in a communication on the above subject to the *St. Louis Medical and Surgical Journal*, October 5, 1880:

It being a fact that serious results do follow the action of cold, we are led to inquire, first, how can the injurious effects of cold upon the ears be prevented? And secondly, how can they be cured after they have been developed?

The first inquiry can only be answered by giving directions as to suitable coverings for the mouth and ears in inclement weather. Those whose ears are sensitive to atmospheric changes should not expose them to currents of cold air. When in the street some covering should be worn, not only over the ears, but over the mouth and nose if the weather is severe. Strict attention to the above directions would save many from much suffering.

The mouth and nose are not sufficiently guarded as gateways to the ears. A majority of the diseases of the ear find their way to that organ by their openings. Cold passes through the mouth and nose and on through the Eustachian tube into the cavity of the middle ear. Too little prominence is given to this fact; every act of swallowing sends a current of air plump into the cavity of the middle ear. After being out in the cold for some time, the air in the mouth and nostrils becomes cold, and it is frequently quite irritating to the sensitive structures of the middle ear.

A woolen covering of some kind worn over the mouth and nose would warm the inspired air and diminish to a great degree this danger to the ear. As a protection to the external ear I would advise any warm covering, but for obvious reasons would warn you against the use of a plug of cotton or any other plug in the external auditory canal, and let but little wrapping around the throat suffice; use the least quantity compatible with comfort.

The answer to the second query is not less important, but compliance with the intricacy of all the delicate details of treatment of many of the diseases of the ear fall most generally within the province of the specialist. To the physician whose armamentarium is made up with the view of combating these diseases, I would say, do not be discouraged by failures to cure, but be thorough in tracing out the pathological condition of every patient's ear which you may examine. Scrutinize every avenue of approach to the ear, particularly the pharynx, fauces, nasal cavities, and Eustachian tube; you must become familiar with the use of the Eustachian catheter, the rhinoscope, and all other now indispensable instruments for the diagnosis and treatment of aural diseases. Ear diseases are generally more or less amenable to treatment, though patience and perseverance are often required, both on the part of the physician and patient, for months of treatment are sometimes necessary to perfect a cure.

WHAT DETERMINES THE SEX OF CHILDREN?

So many interests center in the discovery of the laws which determine the sex of children, that no apology is needed for bringing the more recent views on the subject to the attention of readers.

The latest studies exclude, or nearly exclude, any supposed information which could be derived from the study of sexual development in plants or the lower animals. In the former, it is principally a matter of nutrition, and to some extent so in the latter; while in man this is certainly not the case.

The first question is, *When* is sex determined? Is it at the time of conception or subsequently?

The answer to this appears to be given by the facts connected with double and triple births. It is in the human race a law, without exception, that *twins embraced in the same chorion are of the same sex*. Three explanations of this fact suggest themselves:

1. They are of the same sex because they are nourished by the same maternal blood; but this fails, because then