bilimenta," which flanks the Central Piazza. The upper part of the building forms the Grand "Stabili-menta Hotel," and contains ball, reading, billiard rooms, etc. The mineral water here is steaming warm, but is not comparable in heat to those of Casamicciola. The following is its composition:

Nitrogen.....	444.010	cubic centimeters.
Carbonic acid.....	967.770	"
Sulphate of calcium.....	523.17	grammes.
Carbonate of calcium.....	100.35	"
" " magnesium.....	6.96	"
" " iron.....	1.02	"
Sulphate of magnesium.....	90.48	"
" " sodium.....	127.80	"
Chloride.....	7.80	"
" " magnesium.....	5.40	"
Ammonia.....	0.45	"
Silicic acid.....	11.55	"
Oxide of aluminum.....	2.46	"
Organic material.....	0.03	"
Lithia.....	A trace.	"
Total solid matter.....	878.07	"
Pure water.....	299.12	liters.
Density.....	100.302	"

The baths are all constructed of Carrara marble, are in rooms for one, two or more persons and are reached by marble steps. One "treatment," as it is called, consists of from fifteen to twenty immersions within about two, three or four weeks, the duration of the immersions increasing gradually from fifteen minutes to an hour. After each bath the patient rests from half an hour to an hour in bed. The native residents of the region and throughout Tuscany show great confidence in the merits of these baths, which to the poor among them are given for fifty centesimi per bath. The visitors in the Grand "Stabili-menta Hotel" included many annual *habitués* of the highest social rank, and as even the noblest Italians prefer any audience to no audience at all, I found it extremely easy to become the confidant of a large number and variety of their experiences. Of the whole number, not one of these persons had any accusation against the baths. The larger part spoke very hopefully and a solid proportion furnished tales corresponding to those which had made me incredulous enough to come and see what I could find for myself.

I watched several cases during my six weeks' stay there, but though some patients stated that after the first or second bath they at once improved, such changes were not visible to me. One very remarkable fact on which nearly all agreed who had been to these baths before or some time since, is that the real and greatest benefit began to be realized only some weeks or months afterward, and this in cases in which at the time and soon after taking the baths there was apparently not a particle of benefit. One such case has been under my own notice. This patient had for nearly twenty years been in a state of disability from neurasthenia, and after spending three years in the tropics with only partial relief from rheumatism and sciatica, had to return to England and took these baths *en route*. The benefit, which he really did not expect, amounted practically to nothing at the time, and almost immediately after reaching England he became bedridden with lumbago and sciatica; then came on the cold damps of November for which London is so distinguished, but through it all he has since remained better in every respect than he had been for ten or twelve years before. As this history nearly coincides with that of so many others given me by the patients themselves, my former incredulity is giving place to the question, "How do you account for it?" While waiting for the answer to this question the facts which have at least gained my respect ought, I think, to be known, and I offer them for the benefit of such as they may concern. It is a great advantage to be living in the building in which the baths are situated. This is especially felt in returning from them for the usual rest in bed afterward. The vice-director of this establishment is a physician, Dr. Fairman. The director is Professor Pietro Grocco, of Pisa. Every medical appliance, whether for electrical or other modes of combined treatment, may be found there in skillful hands. I never saw an Englishman or an American in this establishment, though it seems to me to be well worth a trial, especially in cases of chronic rheumatism and allied ailments.—*London Lancet*.

THE ANTI-EMETIC ACTION OF MENTHOL.

DR. R. BLONDEL has recognized this action of menthol for the past five years, regarding it, with carbonic acid, as the most surely anti-emetic of those with which he is acquainted. He notes that both of these remedies are stimulants to the stomach, powerful adjuvants to gastric contraction, and frequently employed in moderate dose to stimulate sluggish muscular work of the stomach; that with the use of menthol nausea and gastric spasm can be stopped at such a point that even ipecac loses its power of producing emesis. He seems to believe that the active stimulant effect of these remedies is produced on contracted muscular fiber. He utilizes this property of menthol in the treatment of dysentery by ipecac, when he administers with it every two hours a fifth of a grain of menthol dissolved in alcohol, to which a smaller quantity of saccharin is added.—*Nouveaux Remèdes*.

PHOSPHATES IN MILK.—Duclaux. (*Ann. Inst. Past.*, 1893, vii. 2, through *Chem. Zeit.*)—According to the experiments of the author, the phosphates in milk are present in suspension and solution. The former are phosphates of iron, aluminum, magnesium and calcium, while the latter consist of nearly equal molecular quantities of phosphate of sodium and phosphate of calcium, held up by sodium citrate. The result of the examination of various kinds of milk is that there is about twice as much calcium phosphate in suspension as in solution, and that the composition of the ash of milk of the most diverse origins is very nearly identical. An attempt to produce a "phosphate milk" by adding phosphates to the fodder has proved quite ineffective, the milk containing no more phosphate than ordinary qualities.

PROTECTION OF IRON AND STEEL SPECIMENS.

A COLLECTION illustrating the various steps in the manufacture of iron and steel was gathered in Pennsylvania by the late Dr. J. Francis Williams for the Technical Museum of the Pratt Institute. The specimens were preserved in dust-proof cases which were not perfectly air-tight. Soon the fractures began to oxidize. As a preventive, bottles of sulphuric acid were introduced into the cases, but without effect. As a last resource, beakers filled with lump calcium chloride were placed in the cases. This proved successful, and an examination of the specimens, after the lapse

of more than a year, showed that none of them had oxidized. Calcium chloride has a strong affinity for water, and this well-known property has been taken advantage of in many chemical operations. The deliquescent salt, with the water extracted from the air, forms a thick liquid, formerly called *oleum calcis*. When the beaker was entirely filled with the calcium chloride, some difficulty was experienced on account of the liquid covering the lumps and rendering the calcium chloride inoperative. This was remedied by covering the bottom of the beaker with some mineral which would raise the lumps of the calcium chloride above the highest level of the liquid. Almost any non-soluble mineral can be used, but Greenland cryolite, being at hand, was used, as the color nearly resembled that of the calcium salt. The beaker required emptying weekly.

Calcium chloride is used by manufacturers and dealers to prevent rust in fine cutlery, surgical instruments, guns, watchmakers' tools, etc. Platinotype paper suffers under the disadvantage of being injured or entirely spoiled by the moisture of the atmosphere; so special tubes with a calcium holder are provided, which enables the photographer to keep the paper perfectly for several months. It is also largely used by the chemist in drying gases, etc. Calcium chloride is cheap, and can be employed with advantage in many of the arts.

PREPARATION OF LIQUID ORGANIC EXTRACTS.*

By C. E. BROWN-SEQUARD, M.D. Paris, F.R.C.P. Lond.

THE medical profession owes a great deal to D'Arsonval for the various forms of apparatus he has contrived for this preparation, and especially for the

STERILIZING FILTER OF D'ARSONVAL.

admirable filter he has succeeded in obtaining after long and most careful attempts. The following is from a paper by D'Arsonval, and relates to the preparation of all the organic extracts, as well as that of the testicular (which we call orchitic) liquid:

* From the *British Medical Journal*.

1. We procure testicles of bulls at the slaughter house. Just after the killing of the animal a ligature is placed as high as possible on the whole mass of the spermatic cord, so as to get at least a certain amount of the blood contained in the veins. When the organs reach the laboratory their coverings are at once cut away with scissors sterilized by heat. The organs are then washed in Van Swieten's liquor, and afterward in recently boiled water. That being done, each of the testicles is cut in four or five slices, which, with the piece of cord, are placed in a glass vase, in which is thrown, for each kilogramme of the organs used, one liter of glycerin marking 30°. The vase is covered, but it is essential, during the next twenty-four hours, to turn over a good many times the slices and other pieces of organs. At the end of that period an addition of 500 cubic centimeters of freshly boiled water, containing 25 grammes of pure chloride of sodium, is made. The liquid so obtained is then made to pass through a paper filter (we use the sirup gray filter No. 8 of the Laurent series). Before doing this, however, we hardly need to say that the paper filter and the glass funnel in which it is placed must be thoroughly washed with boiling water. The filtered liquid is slightly rose-colored. To hasten the filtration it is well to raise the temperature of the glyceric solution to 40° C. (104° F.); the viscosity is thereby suppressed.

2. Of the various means we have made use of to obtain a liquid absolutely free from microbes or other dangerous pieces of solid matter, the most important is the one we will now describe. The sterilizing D'Arsonval filter, represented in the annexed figure, is composed of a metallic hollow cylinder, S, which receives and keeps immovable the thick steel bottle, B, filled with liquid carbonic acid; a metallic tube, F F, which has borne the weight of 200 atmospheres; a metallic stopper screwed on the lower extremity of this tube, and carrying the filtration bougie, b. This bougie is of a kind of clay in which kaolin is replaced by pure alumina; it is fixed on the metallic stopper by an India rubber tube, which is made to press most tightly on the bougie and the metal. A screwing top, V, is attached to the metallic stopper, and by it we can at will close or open the apparatus. When it is opened, the liquid which has passed inside of the filter, b runs out through the tube, a. The top of the tube, F F, is closed by a metallic stopper, V', which is surmounted by a manometer graduated up to 100 atmospheres, and carries also a screwing tap, which allows the escape of the accumulated carbonic gas when this escape is needed. An adjoining lateral tube, E, serves for communication between the sterilizing filter and the liquid carbonic acid contained in the steel bottle, B. A stopper, R, with a steel point, put in action by a key, C, gives the possibility of establishing or stopping communication between the two tubes, B and F F, so that the pressure against the liquid which is to be filtered may be gradual. The two tubes or pieces of apparatus form a whole, fixed on a wooden tablet, S, which is screwed firmly on a table. To sterilize the glyceric liquid it is first thrown into the tube, F F; then, after having screwed solidly the superior stopper on which is the manometer, M, and having turned to the end the closing screws, V and V', the tap, R, of the steel bottle, B, is opened. The carbonic acid enters rapidly into the tube, F F, and presses over the liquid. A pressure of 50 to 60 atmospheres is maintained for about an hour, during which all the microbes that may be present are crushed and killed. The pressure may be increased, notably if the apparatus is submitted to a temperature of 40° C. (104° F.) Neither the albuminoids nor the soluble ferments are in the least altered, as has been ascertained with pancreas and yeast. When the sterilization is considered sufficient (from half to one hour for tissues of a healthy animal), the tap, V', is opened, and the liquid filters rapidly through the bougie, b, after having been submitted to two sterilizations, the first one by CO₂ under pressure, the second by the filtration.

IMPROVEMENTS IN THE MANUFACTURE OF BORAX.

By H. N. WARREN, Research Analyst.

BORACIC or boric acid, as is well known, is one of the feeblest acids to be met with, being readily replaced by all other known acids, and even in some respects by carbonic acid; but, on the other hand, viewing it as an anhydride, we find it standing foremost, and at elevated temperatures even slowly replacing such acids as phosphoric and sulphuric acids.

Boric anhydride is, in fact, when pure, almost entirely fixed at the most elevated temperatures obtainable. A tared platinum crucible containing an ounce of the substance which had been exposed to a full white heat for over two hours was found, after weighing, to have lost in weight but five grains. The peculiar properties of the acid, however, are vastly different, volatilizing readily upon the application of heat, inasmuch that it is practically impossible to distill a solution containing boracic acid without a portion passing into the distillate. Again, if boric acid is melted at a low red heat in a platinum or other suitable vessel, as long as aqueous vapors are discharged, volatilization of the boron present is perceptible until about 70 per cent. of the water present is discharged, the remaining portion of the water being expelled in an almost pure condition.

Taking advantage of these properties, the author has devised a method by which the production of borax is brought about by subjecting common salt (sodium chloride) to the action of the crude boracic acid of commerce aided by superheated steam, the decomposition being effected by employing large clay retorts, composed for the most part of acid-resisting material, the tops being tubulated to allow of the introduction of the steam required during the reaction. The retorts being charged with an intimate mixture consisting of well ground salt and boric acid, the neck of the retort being connected with a refrigerator for the purpose of condensing the acid thus obtained.

Directly the retorts assume a low red heat, hydrochloric acid is disengaged in abundance. The heat is now slightly raised, and the supply of steam so regulated that water in the form of steam is allowed to enter through the tubulure in sufficient quantity to condense the hydrochloric acid formed in connection