

quite as cheap as benzöl and is more volatile. This latter is an important advantage.

Many months since, my attention was directed to a solution of gutta-percha in sulphide of carbon, which originally used as a cement, had been put aside and forgotten. The coloring matter had formed a compact deposit at the bottom of the bottle, and the supernatant liquor was of a very pale straw color; in fact, almost colorless. I at once made a new solution and found that in a narrow bottle, the precipitate soon completely subsided. I then poured my solution upon a sheet of glass contained in a wooden frame, and allowed the sulphide to evaporate, which it does with surprising rapidity. The films of gutta-percha thus obtained were so very beautiful and so very tenacious that I showed some of them at one of the evening meetings of the Dublin Chemical Club, and described the method by which they were produced, not doubting but this was new.

The next day, however, it was pointed out to me that I had been anticipated, and that Payen had obtained a like result in the same way.

Payen, however, seems to have adopted the method merely as one of analysis, and instead of allowing the precipitate to subside, filtered the solution. I find that a solution made by dissolving one ounce of raw gutta-percha in a pint of sulphide of carbon, gives a solution from which the clear portion may be decanted at the end of three weeks. Or following Payen it may be slowly filtered through paper under a bell-jar. And if this be supported on a porcelain dish containing mercury, there will be absolutely less evaporation of the solvent than there would be from the same surface of an aqueous fluid exposed to the air. This method of filtration seems to be capable of very general application to volatile fluids.

To form thin films, the solution is evaporated on a plate of glass, but as the layer at the moment of becoming solid, is powerfully contractile, care must be taken to cut it round the edge of the glass, in order to prevent its rupture from end to end.

A film of gutta-percha thus prepared, appears, by reflected light, of a delicate creamy white, and by transmitted light has an opaline semi-transparency. It is remarkably electric, producing when rubbed between the fingers, in the dark, a flash of light. These thin films have already been put to one useful purpose, that of replacing the ground glass of the photographic camera. It is well known to photographers, that in the image formed on ground glass the most luminous and best defined portion is central, the parts outside the centre being more or less hazy. But if for ground glass, a plain glass upon which a thin coating of the gutta-percha solution has been allowed to evaporate, be substituted, the image is found to be equally illuminated at all points. In microscopic photography, the advantage of this will be readily perceived.

Gutta-percha thus prepared is a mechanical mixture of the resin with water, which, as do most other resins, it absorbs from the air during the evaporation of the solvent. That this is the case may be at once proved by warming a glass plate bearing a film. The gutta-percha becomes perfectly transparent and adheres to the glass like a coating of varnish.

I think I may say in conclusion, that if this process be not already employed for the industrial production of white gutta-percha, there is no reason why it should not be. The

solvent is cheap, and the manipulation simple, and if the greater part of the sulphide of carbon were removed by distillation, the cost would be reduced to a minimum.—*Chemist and Druggist.*

Rubidium and Lithium in Certain Plants.

BY W. A. WETHERBEE, M. D.

Though the compounds of rubidium have hitherto been discovered only in infinitesimal quantities, they are far more universally diffused than is generally supposed. Rubidium is not only detected in most of the mineral spring waters containing large proportions of the salts of lime, potassa and soda, but also in many of the vegetables containing such salts. For example, the chloride of rubidium (Rb Cl=121) has been found, in very minute proportions, with chloride potassium (K Cl), in the saline waters derived from the root of the common beet, and it has also been found in the ashes of coffee, tea, and tobacco, and in argols, or crude tartar, which is derived from red grape wines.

Undoubtedly the color of the beet and of red argols is, to a great degree, due to the presence of this compound, and it may yet also be shown that it is present in many other plants, the infusions of which are colored red or brown. In some of these plants, the quantity of the metallic salt is so extremely small that it can only be detected by spectral analysis, the two intensely red lines of which will be rendered visible by the combustion of one-thirty-thousandth part of a grain. These spectral lines, when once seen, can never be mistaken for those of any other metal; for, besides being of a peculiar red color, and consisting of two lines, they are also of a very low degree of refrangibility, being found at the extreme end of those rays which are the least refracted. The great volatility of this metal and its salts, may possibly account for the fact that many of the vegetable productions mentioned above are rendered comparatively colorless by being heated or boiled in water for a short time.

It should be remarked, however, that chloride of rubidium, when unassociated with other salts, is colorless, and it is only when in combination with certain other salts and organic matter that it produces the characteristic red color. The above remarks, in regard to the red color in plants being derived from their metallic salts, are, however, only theoretical, and experiments have not yet been carried far enough to establish the proof of their authenticity.

There are only two methods by which the salts of rubidium can be distinguished in organic combination from those of potassium, and these are, by the difference in the solubility of their chlorides, and by spectral analysis, by which latter means the metal rubidium was first discovered.

The salts of the metal lithium, though hitherto discovered only in very small quantities, and in only four or five native minerals, are, nevertheless, widely diffused, in minute proportions, in many spring waters, in Artesian wells which have been sunk to a great depth, especially through a stratum of carbonate of lime, and in many plants, among which are the ashes of several varieties of sea weed, those of the grape vine, tobacco, and of numerous others which grow upon peculiar granite soils in Germany and elsewhere.

They have also been detected in the ashes of milk, blood, and muscular tissue, in the latter, three of which they probably are derived from certain vegetables upon which the animal has fed.

The forms in which this metal is chiefly found as an ingredient in plants are, chiefly, the oxide (Li O=15), and the chloride (Li Cl=42). Some of the carbonated mineral waters of Bohemia contain carbonate of lithia (LiO, CO₂=37), but it has not been discovered in this form in any organized body. By the spectral analysis, one-seventy-millionth part of a grain of this metal may be discovered. It is known by a single brilliant red line, while, as already stated, rubidium is detected by two lines.

No doubt many of the plants containing the salts of this metal, as well as those of rubidium, owe much of their therapeutic virtue to the presence of these salts. The various compounds of lithium have recently come into use as medicinal agents, particularly in the treatment of diseases of the kidneys and bladder, and in certain morbid conditions of other functions of the system; and the facility with which it assimilates with vegetable and animal life, renders it the quicker in action, and less necessary to be administered in large doses than any other therapeutic substances.

Again, when many of the common salts, as, for example, several of the phosphates, which form ingredients in our daily food, are brought in contact with the lithium compounds, the latter are precipitated, and thus retained for a considerable time in the system, so that in this manner all their virtues are brought to bear. So popular has lithium become, in its various combinations, among the medical faculty, that it is now incorporated into some of the artificial waters which are sold in drug stores and saloons, and though these beverages do not, by their taste, reveal the presence of any of these salts, they are contained in sufficient quantities to be readily detected by any one of the usual tests by which they are known to chemists. One of the most common of these is by soaking the wick of a spirit lamp in these waters, and drying it, and then igniting it with alcohol, when it will burn with a red flame.—*Journal of Applied Chemistry.*

Salts of Strychnine separated by means of Phenic Acid.

M. Paul Bert submits a property of phenic acid to the attention of chemists, under the impression that it may have some industrial value, or be useful in medico-legal practice. He states that if a dilute solution of hydrochlorate of strychnine be shaken with a few drops of phenic acid, and the emulsion obtained be carefully filtered, the filtrate will be found to be divested of its poisonous properties, the whole of the strychnine being contained in the portion remaining in the filter. M. Bert has assured himself that strychnine may be thus removed with equal facility from putrefied animal matters. If the emulsion obtained by the agitation of phenic acid with the dilute solution of strychnine be treated with ether, the former is removed, whilst the limpid solution is found to contain the whole of the strychnine. M. Bert has not extended his experiments to many alkaloids, but leaves the determination of the value of the process to other chemists.—*Chemist and Druggist.*