

metric solution whose factor has not changed more than four points in the third decimal place in titrating 25 cc. of one solution against 25 cc. of another solution is regarded as not having changed its strength.

These results indicate that any of the above methods may be used with perfect safety for the standardization of volumetric acid and alkali solutions although our personal preference is for the ammonium sulphate, sodium carbonate, and potassium bitartrate methods.

I would take this opportunity to acknowledge my indebtedness to my assistant, Dr. J. Swartz, for his work in carrying out some of the duplicate determinations.

SOME FACTS AND DEMONSTRATIONS ON LLOYD'S REAGENT AND ALCRESTA ALKALOIDS.*

DR. GUSTAV REHFELD, ST. LOUIS.

I am very glad that you afforded me an opportunity to address you to-night and I hope to be able to interest you.

I feel that Lloyd's Reagent and the Alcresta Alkaloids will prove to be, in the near future, a matter of great importance in the fields of exact and applied sciences.

It has occurred many a time in the past, that apparently trifling circumstances were instrumental in revolutionizing the fields of human endeavor. Every one of you is familiar with the cause that gave the first impulse to the evolution of the laws of gravity, how the swinging of a candelabrum affected the science of physics, how an accidental arrangement of lenses fostered the invention of the telescope and the microscope, how the insignificant popping of the lid of a tea kettle brought about the wonderful development of steam power. It is unnecessary to enumerate any further; you know that most discoveries had their starting point in just such every day occurrences; millions and millions of times they happened and millions and millions of times they passed unrecognized until some one somewhere caught the revelation and thereby enriched human knowledge generally, opening up new view points and thus engraved his name indelibly on the pages of historical record.

I feel that the discovery of Dr. John Uri Lloyd is destined to do just such a thing, to change our viewpoints considerably, to make our knowledge more exact in a field that is not altogether easy of treatment and which will, thereby, benefit mankind generally, as it affects chemistry, medicine and pharmacy.

I wish to say to you though, that some time will elapse before the far reaching results, which we expect to get, will be realized. However, enough facts have been established to leave no doubt whatever, that this discovery will affect chemical research in alkaloids; that, already, it has given the medical profession a most valuable addition in materia medica, and to the pharmaceutical profession a means of rendering intensely bitter substances absolutely tasteless.

A few years ago Dr. John Uri Lloyd, of Cincinnati, discovered that a very

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common substance, aluminum silicate, in hydrated colloidal form, acted as an alkaloidal attractive. He investigated this phenomenon for a long time together with Dr. Waldbott, of Cincinnati, and about a year later Dr. Felner established the physiological action of its strychnine compound.

Some time after, Drs. Wiley, Wilbert and Kebler, all of Washington, D. C., were made acquainted with the alkaloidal energies of this substance, and toward the middle of 1913, Drs. Gordin and Fantus, of Chicago, contributed the first general papers on the subject. And this is about all that is known on this subject to date, as far as published reports are concerned.

Through the courtesy of Eli Lilly & Co., whom I have the honor to represent, I am enabled to-night to exhibit before you as a representative body of the St. Louis Branch of the A. Ph. A., the first samples of Lloyd's Reagent and a few Alcresta Alkaloids. These names were given to these products to individualize them, as standing in a class of their own. Your Branch is the first in the world to see and possess these preparations, as I have been permitted by Eli Lilly & Co. to present them at the end of my talk to the St. Louis College of Pharmacy.

Lloyd's Reagent, as stated before, is hydrous colloidal aluminum silicate. However, the various forms of natural aluminum silicate possess usually very slight alkaloidal affinities in their crude condition. In order to obtain uniform results, it became necessary to prepare it in a particular manner from a specially selected quality of natural hydrous aluminum silicate. Through the well directed efforts of our scientific department, we are enabled to-day, to supply Lloyd's Reagent of uniform attractive strength.

You will have noticed that I used the word attractive, where another word, reagent, would, apparently, have been more appropriate, but I did so, because our ideas of chemical reagents are pretty well established, and as Lloyd's Reagent acts electrically, it seemed the better word.

Lloyd's Reagent is practically insoluble in all liquids, and an excess is therefore inconsequential. Please bear this in mind when I shall demonstrate its energies before you to-night. When we add Lloyd's Reagent to a solution of alkaloidal salts, they are at once removed and held firmly in aluminum silicate combination. This holds true with the natural alkaloid compounds investigated to date; however, one exception should be noted and that is caffeine. It takes repeated treatment with Lloyd's Reagent to remove it from solutions, and this confirms our findings that caffeine is a feeble alkaloid. It certainly is feebly attracted by Lloyd's Reagent, and removed with difficulty, as I said before.

A very noteworthy feature of this Reagent is, that it has no affinity for other substances, especially those that are usually associated with alkaloids in plant-glucosides. It is, therefore, possible, as a matter of fact it has been successfully accomplished, to remove the alkaloids from fluidextracts without disturbing any of the other active or inert constituents as in the case of ergot. In order to facilitate the action of Lloyd's Reagent, the solutions should be acidulated.

As this reagent acts electrically, you will not be surprised to learn that the alkaloidal salts do not undergo any chemical change at all, in other words, quinine sulphate, morphine sulphate, strychnine sulphate, etc., will be removed as quinine sulphate, morphine, or strychnine sulphate as the case may be. But, note the remarkable phenomenon, that as long as these salts are in aluminum silicate

combination they are absolutely tasteless and not soluble in acid solutions any longer, while alkaline solutions destroy the electrical affinity gradually, and the alkaloids regain their bitter taste and previous solubility. This is of immense importance to internal medication. The Alcresta Alkaloids, being enteric, can be introduced into the system and directed to the very seat of the trouble without disturbing the functions of the stomach. Think what this means, for instance, in the case of ipecac; in fact with all, when employed in the treatment of intestinal disorders. The great usefulness of Alcresta Alkaloids becomes at once apparent, does it not? You readily will understand also, that these preparations are not intended nor destined to replace the old form of alkaloids, as both will have large fields of usefulness in therapeutics.

The affinities of Lloyd's Reagent for the different alkaloids vary greatly, as can be seen from the limited number of alkaloidal solutions investigated and listed; for instance, to precipitate:

- 1 Gram Cocaine hydrochlorate requires about 10 grams of Reagent.
- 1 Gram Cinchonine sulphate requires about 10 grams of Reagent.
- 1 Gram Cinchonidine sulphate requires about 10 grams of Reagent.
- 1 Gram Brucine sulphate requires about 7 grams of Reagent.
- 1 Gram Morphine sulphate requires about 4 grams of Reagent.

A correct list of all alkaloids investigated, will, no doubt, be given to investigators interested, by Eli Lilly & Co., upon request.

With your kind permission, I shall now demonstrate to you the efficacy of Lloyd's Reagent on various alkaloidal salt solutions. In order to remove any doubt, as to the presence of the alkaloids in these solutions, I shall first prove their presence by Mayer's Reagent, and after removing them by means of Lloyd's Reagent, shall demonstrate their absence by Mayer's Reagent.

I have chosen for this demonstration solutions of berberine sulphate, morphine sulphate, quinine sulphate and strychnine sulphate, all of the same strength, that is 1 percent.

Now as far as the recovery of alkaloids is concerned from their aluminum silicate combination, it is easily accomplished by means of ammoniated chloroform. In most instances the alkaloids can be removed from the dry powder, but where the alkaloid does not yield readily, the addition of a little distilled water is sufficient to bring about the desired result.

It probably will not be amiss to express the hope that later investigations of Lloyd's Reagent will bring about abbreviated and reliable methods of assay. Unfortunately, I am not in a position to-night to say whether or not we shall be able to do so. But let us hope that some one may be successful to evolve a short and reliable method by means of it. It would be an achievement of considerable moment.

I would like to call your attention also, to another matter which occurs to me should be investigated since we became acquainted with the mysterious activities of Lloyd's Reagent, and, that is, our filtering media. We are using talcum powder, pumice stone, kieselguhr, and others to help clarification of pharmaceutical preparations containing active ingredients. You know now what would happen if you were to filter an elixir containing alkaloids through Fuller's earth.

It seems to be that the electrical energies of the different media should be investigated, as unusually brilliant and otherwise elegantly appearing liquids may be devoid of active constituents, after filtration. As long as we do not possess positive knowledge about the electrical character of those substances, it may be wise to use paper pulp.

In conclusion, I wish to say to you, that Dr. Lloyd, as well as Eli Lilly & Co. stand ready at all times to render all possible service to further earnest scientific investigation. All inquiries for experimental supplies should be made to Eli Lilly & Co., Indianapolis, Ind., where they will find prompt attention.

INDISPENSABLE INSURANCE FOR PHARMACISTS.*

FRANKLIN M. APPLE, PHAR. D., PHILADELPHIA.

History has shown that it is the practice of shrewd, hard-headed, far-thinking men to protect their most valued possessions by some form of insurance. The greater the possibilities that they will suffer a severe loss from destructive forces, the more the desire to protect themselves from these agencies, and to increase the amount of the protection.

Our government has always recognized the wisdom of protection against all forms of invading and destructive forces by establishing agencies to conserve the desirable assets, as well as to repel the destructive invaders.

Our Army and Navy are supported and maintained chiefly to ensure peace to the nation by moral influence, and our Federal Public Health Service is depended upon to protect us from injury from organisms that would greatly distress, if not annihilate us if permitted to carry on their destructive work unimpeded.

Within recent years the wisdom of calling a halt upon the wasteful methods of handling our natural resources has been more apparent, and has given rise to an era of greater conservation, for we must admit that we, in large measure, are guardians of these wonderfully rich possessions for posterity, as they have been handed down to us by our forefathers. This conservation is but another name for insurance against waste and extinction.

Before me, as I pen these lines, lies the advertisement of a large bonding and insurance company, in which is described a form of insurance for almost everything that has a monetary value—even re-insurance of other forms of insurance; but to the pharmacist the most vital form of insurance is not included in the long list of classes of risks, viz., insurance of Professional Pharmacy, the backbone and sinew of the profession.

The omission of this form of insurance is excusable, for it is impossible for any company to write this kind of policy. It can only be obtained by co-operative action of pharmacists in a society, founded upon principles recognized to be honorable, unselfish, uplifting, ethical and of mutual benefit to its members and to society generally.

Such a praiseworthy assemblage of men and women is exemplified by the oldest

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